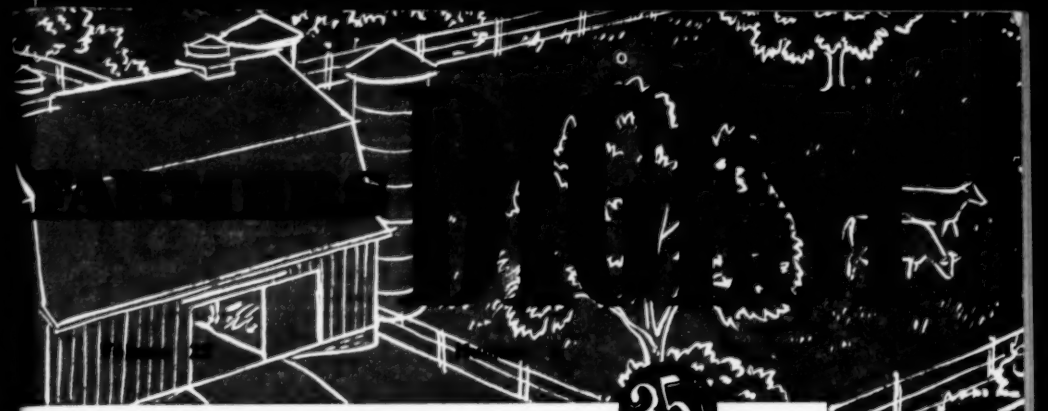


35

Contents for May 1958

First Stilbestrol, Now Tapazole — WOW	Farm Journal	1
Scouring Is Your Fault	Farmer and Stock-Breeder	4
Milk Solid Content Influenced by Feed*	Florida Experiment Station	6
New Gains from Pellets for Swine	Breeder's Gazette	7
Fall Cattle Feeding Outlook*	Utah State University	9
Early Lambs Make the Most Money	National Live Stock Producer	10
Killer for Weeds in Soybeans	Iowa Farm Science	13
Good Silage Is Put Up Fast	Crops & Soils	17
Facts About Large Dairy Herds*	Purdue University	21
New Methods and Materials Fight Weeds	Michigan Farmer	22
American Agriculture in 1965	Michigan Farm Economics	27
Vernal Least Damaged by Frost*	Wisconsin College of Agriculture	30
Insecticide Protection for Your Corn	Nebraska Farmer	31
Rate of Egg Production Determines Hen's Value*	University of Mo.	34
Is Agriculture Paying Too Much Taxes?	The Nation's Agriculture	35
47 Tested Ideas for Hog Profits	The Farmer	40
Beef Cattle Cycle, Future Prospects	Illinois Farmer's Outlook Letter	45
Sales Taxes Increase Farm Tax Burden*	Minnesota Extension	46
What We Know About BLOAT	Hoard's Dairyman	47
The Virtues of Oxen in 1907*	Old Farmer's Almanac Sampler	53
The Dairy Revolution that Started in 1940	Farm Economics	54
Antibiotics Little Help in Jumping Milk Yields*	Missouri Farm News	56
How To Fight the Spotted Alfalfa Aphid	Better Farming	57
Is Irrigation for You?	Successful Farming	61
New Take-Down Prefabricated Milking Stalls*	University of Wisconsin	64
Tranquilizers . . . Can They Bring Bigger Profits?	The Young Farmer	65
2,4-D Controls Gophers*	Colorado State University	70
Should We Give Up Oats?	Massey-Ferguson Farm Profit	71
Proved Sires Are Improving Dairy Herds*	U.S.D.A.	74
Machine Milking Is An Art	Wisconsin Agriculturist	75
Does It Pay to Dehorn Yearling Steers?	Farm and Home Research	78
Egg Yolk Test Aids Mastitis Research*	Wisconsin Extension	81
Balance the Rumen As Well As the Ration	The Dairy Farmer	82
Organize Attack on Fire Ant*	Texas Extension	83
How To Feed Hay	Checkerboard Service Magazine	84
Shaping the Land for Irrigation	Implement and Tractor	86
New Ways to Check Baby Pig Anemia*	Oregon State College	89
Conservation Reserve Program	Journal of Soil & Water Conservation	90
Where's the Cat-ch in This Opportunity*	Geographical Review	93

*Short Features in This Issue. One Year Continuing Index, **pages 94 & 95**

THE FARMER'S DIGEST
81 N. Main St., FORT ATKINSON, WIS.

FARMER S DIGEST STAFF
Editor and Publisher — Hugh Highsmith
Livestock Editor — Al Haller
Office Manager — V. M. Binkert
Industry Sales Representative — Raymond C. Groendyke
Subscription Service — E. M. Hartwig

Published monthly, except June-July and August-September, when published bimonthly at Fort Atkinson, Wisconsin by the Highsmith Co. Inc.

Subscriptions in U. S., U. S. Possessions and Canada: One year $3.00, two years $5.50, three years $7.75.

Subscriptions to Other Countries: One year $3.50, two years $6.50, three years $9.25.

ADVISORY EDITORIAL STAFF
William A. Albrecht, Chairman
Department of Soils, U. of. Mo.
Hugh H. Bennett, Ex-Officio, Soil Conservation Society of America
G. B. Gunlogson, Agricultural Engineer
H. J. Reed, Dean of the School of Agriculture; Purdue University
T. J. Rutherford, Director, Veteran's Land Act, Ottawa, Canada
W. T. Spanton, Chief of United States Ag. Education Service

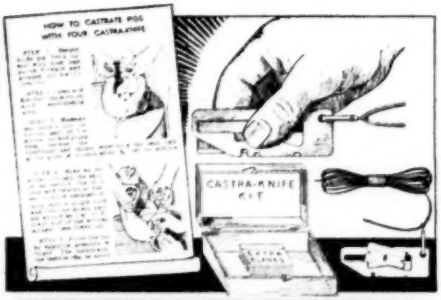
POSTMASTER: Send notice on POD Form 3579 to Farmer's Digest, 81 North Main St., Fort Atkinson, Wis. Entered as second-class matter at the Post Office at Ambler, Pa., July 30, 1948, re-entered at Fort Atkinson, Wis., additional entry at Jefferson, Wis. under the act of March 3, 1879. Printed at Jefferson, Wis.

IMPORTANT!

Farmer's Digest Summer Publishing Dates

During the summer months, Farmer's Digest is mailed to you every 45 to 50 days instead of monthly. This practice, started years ago, keeps our subscription rates down by giving you fewer copies when you have less time to read. You will receive our June-July issue on or about June 20; our August-September issue on or about August 15. Following issues will again arrive near the first of the publication month.

The Publisher



PIG & CALF CASTRATING KIT
With New Castra-Knife, Illustrated Instructions, Lanyard, Etc.

Students and beginners who have never done the job can now save important money. Do your own castrating and **do it right.** Half a litter or one calf pays for this kit.

The new Castra-Knife is a sharp, handy, safe razor-blade cutter. Unlike old type castrators, it is always super sharp for a fast, sanitary, humane job. It is safer for you and the animal because blade sets to limit depth of cut, also retracts and is shielded when not in use.

Authorities say illustrated instructions are best ever prepared covering old scrotal sac operation and new college-approved, simplified ventral incision method. Plastic lanyard cord with swivel suspends knife from clothing to free hands between operations. Saves time and avoids contamination. Kit also includes five extra blades and a plastic case. Order from this ad. **Send only $1.95.** Postpaid. Money back guarantee.

THE HIGHSMITH COMPANY
Fort Atkinson 21, Wisconsin

The **Farmer's Digest**

Volume 22 **May 1958** **Number 1**

First Stilbestrol, Now Tapazole — WOW

A new beef additive boosts gains up to 21%, improves feed efficiency 13% over stilbestrol in Iowa tests . . .

Condensed from Farm Journal

Dean Wolf

IF TWO TESTS mean anything, a new gain-booster called Tapazole puts more "kick" into cattle supplements than anything since the discovery of stilbestrol.

It's the new beef feed additive that Iowa State scientist Wise Burroughs and associates unveiled recently.

Here's why it has cattle feeders so excited:

- Tapazole stepped up gains and improved feed efficiency *more than stilbestrol* in the one test comparing the two directly.
- And, more important, it seems to team well with stilbestrol — *the combination boosts gain well above that of either additive alone.*

In his first test, Burroughs had 2-year-old steers on a 79-day feed. A check lot got a full feed of cracked corn, 6 lbs. of alfalfa hay and 1 lb. of supplement *containing stilbestrol.* Four other lots got the same ration plus 200, 400, 600 or 800 milligrams of Tapazole per head daily.

Steers getting 600 mgs. of Tapazole gained 3.58 lbs. per day—a 21% increase over the 2.95 average for the check lot. They made 100 lbs. of gain on 111 lbs. less feed, a 13% saving. They returned $12.44 more per steer above feed costs. And remember that the check lot steers had stilbestrol.

Averaging all four levels of Tapazole together, it improved

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

gain 12% and feed efficiency 7%.

There was no significant difference in carcass grade or yield. Control lots had four choice and six good carcasses. Tapazole lots had eight choice and twelve good.

About one-third of the cotton grown in the United States is exported.

In his second test, Burroughs fed yearling steers a full feed of ground ear corn, 3 lbs. of alfalfa hay and 1 lb. of supplement. The check lot got neither stilbestrol or Tapazole. Another lot got stilbestrol alone. The others got 300 or 600 mgs. of Tapazole with and without stilbestrol. Here's what the record sheets showed after 56 days on feed.

Tapazole (600 mgs.) boosted daily gains 17% (3.4 lbs. compared with 2.9) and improved feed efficiency 13%. That's a bigger "kick" than from stilbestrol which stepped up gain 13.8 per cent and feed efficiency 9 per cent.

Tapazole and stilbestrol *together* boosted gains 27% and improved feed efficiency 17% compared with the check ration.

The steers getting both growth boosters made a whopping 3.69 lbs. of gain per day and produced 100 lbs. of beef on 575 lbs. of feed.

Tapazole appears to work the same way with steers that have been implanted with stilbestrol pellets as those that get the hormone in the feed.

In a University of Arizona test, *steer gains were increased up to 10% when Tapazole was fed atop stilbestrol implants* and 80 milligrams of aureomycin per day.

And E. S. Erwin, researcher who carried out the Arizona trials with J. W. Blair, reports: *"The combination of low-level Tapazole* (14 mgs. per pound of concentrate fed) *and stilbestrol increased carcass grades about three-quarters of a grade* compared to others where stilbestrol alone was used."

The Arizona cattle weighed in at a little over 700 pounds at the start of the 97-day test. They were fed a ration that consisted (by weight) of one part Hegari silage, one part alfalfa hay and two parts concentrates. Total feed consumed was a little over 20 pounds per head per day.

The cattle were trucked 500 miles—from Tucson to Los Angeles — for slaughter. Tapazole made no difference in transit shrink, nor did it affect dressing out one way or the other, Erwin found.

At a higher-level Tapazole dosage—28 mgs. per pound of concentrate—Tapazole-stilbestrol improved finish by a half-grade

compared with no Tapazole. But gains fell off to approximately that of the non-Tapazole fed lots.

Tapazole improved feed efficiency, too, although not as much as in the Iowa tests. The three lots getting 14 mgs. Tapazole with different level stilbestrol implants (6, 18 and 30 mgs.) ate an average of 728 pounds feed per hundredweight gain. This compared with 756 pounds for the lots getting the aureomycin and various levels of stilbestrol implants but no Tapazole.

Tapazole has been used for several years in human medicine for the treatment of over-active thyroids. Usual human dosage is 5 to 15 mgs. a day. Tapazole is made by Eli Lilly and Co., Indianapolis, Indiana.

You won't be able to buy supplements containing the new gain-booster until enough tests show it works over a wide range of feeding conditions and is safe for consumers.

Some of these answers will be coming before the end of the year. Iowa State already has two new tests underway. Some researchers are already testing the products for lambs. The University of Arizona concluded a trial last week in which lamb gains hit .701 pound daily with Tapazole and aureomycin added to a ration which included 60% gin trash as the only roughage. The top gaining lambs were given 3 mg. stilbestrol implants. (Implants for lambs have not yet been approved.)

"Tapazole looks as exciting now as stilbestrol did at the same stage of development," Burroughs says. "But, I've got my fingers crossed." And you can't blame him for being cautious. It's almost too much to expect two feeding discoveries like stilbestrol inside of 5 years.

Tripling Dairy Herd Size Only Doubles Labor Needs

Tripling the size of the dairy herd doesn't mean tripling the chore load.

A 1-year University of Minnesota study on 100 farms in southern Minnesota shows that a 30-cow dairy herd calls for only twice as much labor as do 10 cows.

H. J. Aune and L. M. Day found it takes almost 129 hours during the year to care for each cow in a 10-cow herd. In a 30-cow herd, it takes only 80 hours per animal yearly.

—University of Minnesota

Scouring Is Your Fault

An English veterinarian puts the blame for this wide-spread calf disease right at the door of the dairyman . . .

Condensed from Farmer and Stock-Breeder

THE fundamental cause of White Scour in calves is the rapid multiplication of *Bacterium coli,* which is a normal inhabitant of the bowel. The factors which bring about this rapid multiplication are many and varied. The one fact which fascinates me as a practicing veterinary surgeon is that farmers can go on making the same mistakes year in and year out, losing calves with scour as a result and yet never applying their bitterly-gained experience to the next batch of calves.

There are exceptions, I know, but I am surprised how few and far between they are.

Natural Rearing

Let us consider the cow in the "natural" state. She calves outside in a field free from infection to all intents and purposes. The calf is then able to help itself to colostrum and later on to milk exactly when it feels hungry. The milk is supplied at the right temperature (body temperature). The calf nibbles a little grass when it feels like it, and so it grows up.

Unfortunately, economics have forced us as far away from this natural process as possible. The cow milks heavily all through her pregnancy—she may even milk right through and never produce colostrum at all. She calves in a far from hygienic loose box rich with *b. coli.* The calf is removed after 24-48 hours, if not at once, and put on pail feeding twice a day.

The milk is offered at varying temperature, it is often far from clean, the calf is usually overhungry, it is forced to drink instead of suck; and then farmers wonder why the delicate digestive system revolts and calf scour appears.

Reprinted by permission from Farmer and Stock-Breeder, Dorset House, London S. E. 1, England

Symptoms of Scour

Everybody who keeps calves must know what scour looks like. The familiar whitish-yellow diarrhea, the starey coat, lack of appetite, kicking at the belly with "colicky" pains, and finally the dehydration (shortage of fluid), collapse and death.

Grasses and legumes should be seeded together, according to Purdue agronomists. You get higher yields of better quality forage, and control erosion and weeds. There's less danger from bloat, less danger from heaving damage to alfalfa, and a longer grazing season.

The infectious nature of this condition is of vital importance, too. Get a good dose of calf scour through a pen of calves and you really have trouble.

Let us suppose that your calves *have* got the scour. What can be done about treatment? I would suggest that one of the most important discoveries in the correct diagnosis and treatment of calf scour has been the six-hour sensitivity test, perfected by Dr. William-Smith of the Animal Health Trust Research Station at Stock, in Essex, England.

A swab from the rectum of the infected calf is sent to the laboratory and in six hours it is possible to know the *correct* antibiotic to use in the treatment of this case or outbreak. This to my mind is a great advance on the "slap-happy" use of antibiotics, sometimes in cases where the *b. coli* were resistant to the type antibiotic being used.

What to Do

In the event of scours, my advice would be this. Telephone your veterinary surgeon at once, isolate the affected calf in a warm, dry, small straw bale compound, put an infra-red pig lamp over him and a bag around him, and get him really warm. Bottle feed if necessary with warm milk and glucose, or warm water and glucose, giving five or six small feeds a day.

Your vet will prescribe the drug to be used. You are ill-advised to start giving some antibiotic "left over from the last case." You will ruin the value of a laboratory test of feces and do more harm than good. You concentrate on the nursing—that is of major importance.

If possible, you would be well advised to move other calves in the bunch into a clean box. If this is impossible, rig them a temporary shelter with straw bales and get the box mucked out, washed out and rebedded.

Why is colostrum so important to the new-born calf? Just imagine for one moment the tremendous difference between the

calf's life immediately before and immediately after birth.

In the fetal state, while lying in the cow's uterus, the calf receives nourishment well prepared from the dam's blood. Within a few hours it is outside the uterus in a much-reduced temperature and it has to supply itself with nutritives through its mouth. The food so taken has to be absorbed by a stomach and intestines which are absolutely untrained for this job.

The only food which has a composition suitable for this undeveloped digestion and containing the vital materials so needed by the calf is colostrum. Colostrum is more concentrated than ordinary milk. It contains much more protein, and this protein contains a high percentage of antibodies against disease bacteria. Deprive the calf of colostrum and you deprive it of defense.

Vitamin Rich

Colostrum is also rich in vitamins. Calves at birth are low in vitamin A. Colostrum supplies this, also vitamins B^2 and C.

A third function of colostrum is that of a mild laxative.

The importance of cleanliness speaks for itself. The cause of scour is *b. coli.* If you are going to put new-born calves in filthy boxes which are rich in *b.coli* then you can expect trouble. The same applies to the preparation of the calf's food. The fewer bacteria that go down that young throat the better.

If your calves get the scour you can only blame one person — yourself.

Milk Solid Content Influenced by Feed

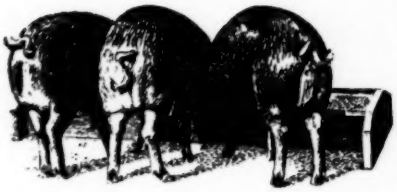
The butterfat and solids-not-fat content of milk is determined by the quality of feed a cow receives, it has been revealed in trials conducted by Dr. R. B. Becker, Florida dairy husbandman.

A drop in butterfat was noted when cows received beet pulp, chopped hay, or other coarse feed along with the concentrate. When long hay, corn silage or good green pasture was substituted for coarse roughage, butterfat content rose to the normal level of the cow's capacity.

Dr. Becker says the solids-not-fat, which comprise about 8.5 per cent of the milk, dropped when the ration was deficient in energy feed. Increasing the intake of energy feed brought the solids content back to normal. These solids contain the vital minerals and other health-giving nutrients of milk.

—Florida Experiment Station

New Gains from Pellets for Swine



Experiment station tests show faster gains and less feed required per pound of pork . . .

Condensed from
Breeder's Gazette

O. O. Thomas and *A. E. Flower*,
Montana State College

RAPID GAINS have been made in recent years in feed utilization by swine. Some of this improvement in feed efficiency has come through new nutritional knowledge and proper application of this knowledge to feed practices. Since feed costs represent about 80 per cent of the total cost of hog production, efforts must be continually directed toward reducing this cost.

One way to reduce this total expense is to pellet mix rations. From experiments started in 1951, Montana State College has found that this method reduced the amount of wasted feed, saves labor and increases gains.

One hundred and eighty crossbred and purebred pigs of Duroc-Montana No. 1 breeding were used in running this experiment. They were divided into two equal lots. One was fed a ration in pelleted form, and the other was fed the same ration in ground or meal form. The ration was composed principally of small grains—barley and wheat mixed feed; the pigs were self-fed in large pens of similar size and had access to identical self-feeders and waterers. A ration containing approximately 20 per cent protein was used until they reached an average weight of 75 pounds. From 75 to 125 pounds the ration was reduced to 16 per cent protein and was further reduced to 14 per cent beyond 125 pounds.

The results of this test in weight gain and feed efficiency are shown in Table 1. The average weight of the pigs at the start of the trial was 27 pounds. Those fed a pelleted ration gained an average of 1.35 pounds per day from weaning until market and reached market weight 12 days sooner than those fed meal. Pigs fed the meal ration gained an average of 1.23 pounds per head per day and required 474 pounds of feed per 100

Reprinted by permission from Breeder's Gazette, Columbia, Missouri

pounds of gain. Although the pelleted feed cost 10 cents more per hundredweight, the feed cost for the pellet-fed pigs was $1.42 less per 100 pounds gain than for the meal-fed pigs.

Other stations studying this type feeding reported equally favorable results. Washington State College found that pelleting of the feed represented an estimated saving of 30 per cent feed. In addition, the pigs which were fed pellets gained approximately one-tenth of a pound per day more than those fed the ration in meal form. They concluded that pelleting of feeds may be worth 10 to 40 per cent of the value of the feed, depending upon the conditions for feeding.

At the Idaho Experiment Station it was found that pigs fed the pelleted ration gained from 0.09 to 0.15 pounds more daily in one trial and 0.22 to 0.28 pounds more in another, than pigs fed meal rations.

North Dakota Agricultural Experiment Station reported that pigs fed pelleted (high barley) rations gained 12 to 14 per cent faster and consumed 17 to 18 per cent less feed per pound gain.

Solid and liquid mixed fertilizers are about equally effective, according to tests at midwest agricultural experiment stations.

The results of these trials indicated that the feeding of pelleted rations, constituted largely of small grains and their by-products, increases daily gains. Pelleted rations reduce the amount of feed required per 100 pounds of gain, and reduce the time to reach market weight. Pigs fed pellets waste less feed and appear to require less time at the feeder to satisfy their appetites. Feed-

TABLE 1.—Results of feeding pigs a ration as pellets or meal—

Feed Treatment	Pellets	Meal
Number of pigs[1]	90	90
Average weights (lbs.)		
Initial	27.4	27.0
Final	214.0	211.3
Daily gain	1.35	1.23
Number of days of feed	138.2	149.9
Feed per cwt. gain (lbs)	420.7	473.6
Cost of feed per cwt. (dollars)[2]	3.59	3.49
Feed cost per cwt. gain (dollars)	15.10	16.52

[1] Two pigs in Lot 1 and one pig in Lot 2 were removed from the trial. Data on these pigs are not included.
[2] Weighted average cost of feed.

ing pelleted rations saves considerable labor by decreasing the time required for pigs to reach market weight. If the cost of labor had been included, the savings attributed to feeding pellets would have been appreciably increased.

The southwest corner of your basement offers the greatest safety from tornadoes.

If recommendations are based on these trials, a swine producer who buys a quantity of feed and has the choice of buying a meal or a pelleted ration can well afford to pay the extra cost for pelleted feed. The producer who buys a limited amount of supplements must balance the cost of grinding and mixing home-grown grain with purchased supplements against the cost of hauling and having his feed fortified and pelleted; another alternative would be buying a complete pelleted hog feed. The anticipated gains of 0.1 to 0.2 pounds per day, saving of 50 to 75 pounds of pork produced, selling on an earlier market, and saving in labor must offset or exceed the added cost of pelleting.

Fall Cattle Feeding Outlook

"The outlook for a good price on feeders next fall is good," reports Harry H. Smith, livestock marketing expert. The calf crop will be smaller than in 1957. Even if we should have some drought this summer, the demand for feeders will be strong.

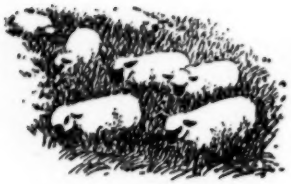
When cattle buyers want to contract your feeder cattle for next fall's delivery, remember he is doing it because he thinks they will be higher at that time than they are now. That is the reason he is out contracting.

Professor Smith points out that recent high prices of fat cattle prove that none of us have infallible crystal balls. The prices of fat cattle have gone higher and stayed up better than any of us anticipated. The reason is there were fewer hogs and cattle held back to eat up wet corn.

Slaughter has been off from 10 to 15 per cent since January 1st, lamb slaughter is down 10 per cent, and veal is also down. It is the light marketing of fat cattle which has given the market the boost. Also, the marketing of cows and other low grade slaughter cattle has been unusually small. The supply of pork has declined from 67 pounds per person in 1956, to 62 pounds in 1957.

—Utah State University

Early Lambs Make The Money



January and February lambs are the profit makers. In four of the last five years, early lambs marketed in May and June brought at least $3.00 per cwt. more . . .

Condensed from
National Live Stock Producer

R. L. Coppersmith and *Harold Guither,* University of Illinois

IF YOUR EWES dropped January and February lambs, you have a good chance to make top money on lambs this year. The flock owner with March and April lambs must plan ahead for next year when he can do better by raising early lambs.

Producers of early lambs get higher prices. Every year for the past five years, the lamb producer who sold in May and June averaged from $1.50 to nearly $7 per cwt. more than the producer who sold in September and October. In four of the last five years, this advantage has been $3 per cwt. or more.

The late lamb producer who thinks he can put weight on late lambs and do as well is only fooling himself. Here's what the market price records show.

In four of the last five years, 90-pound lambs in May and June have brought more than 100-pound lambs in September and October.

Early Lambs Grade Higher

And the chances of getting lambs to grade Choice or Prime are much better on the early sales. Some market records in Illinois show that about twice as many early marketed lambs grade Choice and Prime as the late marketed lambs.

Some producers feel they can't afford to feed grain to lambs in order to market them early. They should ask themselves if they can afford not to. The risks of death loss, parasites, and price changes in summer and fall usually offset the extra cost of spring grain feeding.

Year after year, good sheepmen find it's easier to produce high quality lambs early in the season. In most parts of the country, this means having them on the market by July 1 or earlier if possible. More favorable weather and pasture conditions for early lambs usually results in higher quality lambs going to

Reprinted by permission from National Live Stock Producer, 139 N. Clark St., Chicago 2, Ill.

market. Hot weather and dry burned-up pastures in July and August don't favor production of top quality lambs.

But to raise early lambs and have them on the market in May and June requires careful planning and good management. Don Walker, University of Illinois live stock specialist, reports that the best shepherds do it this way.

Leptospirosis, a cattle disease that not so long ago was rated of little importance, has become the third most costly livestock disease in the United States.

They pick out big ewes with sound mouths and udders and breed them to a good mutton type ram. And to have early lambs, they have to be bred early.

Early lamb producers get the ram working just as soon as cool nights in August bring ewes in heat. They try to get all ewes bred by early September. This will schedule the lambs for January and February arrival.

Add Some Protein Supplement

During the last four to six weeks of gestation, these top sheep producers feed bred ewes from ½ to ¾ pound of grain per head per day plus green leafy legume hay. If the hay is not top quality, they add a little protein supplement to the grain.

When ewes are about ready to lamb, they are separated from the rest of the flock. Most flock owners will find two four-foot panels hinged together ideal for this job.

As the ewe starts to lamb, the shepherd sticks close by and is ready to give help if needed. Sometimes the ewe won't be able to deliver the lamb without help. Or the new born lamb may need additional attention.

Treating the lamb's navel with iodine or other disinfectant takes only a few minutes and prevents infection. In cold weather, heat lamps will prevent chilling.

For constipated lambs, the experienced sheepman gives a table spoon of milk of magnesia or one or two tablespoons of castor oil. If pinning develops, scrape the manure from the tail and rump.

Lambs will do better if castrated and docked when one to two weeks old. They seem to take these operations with less set back at that age.

Sheepmen who want to sell lambs early should give their lambs every chance to eat. Shearing the wool away from the ewe's flank makes it easier for the young lamb to find the teat and suckle. Wooly udders should be trimmed, too.

Creep Feeding Boosts Gains

The experienced sheep producer also creep feeds to get lambs on May and June markets.

Usually they start creep feeding when lambs are a week to 10 days old. Early lambs make very efficient use of creep rations, often putting on a pound of gain with the ewe's milk and 1¼ to 1½ pounds of feed. Older lambs require at least three to four times this amount of feed per pound of gain. Creep fed lambs gain rapidly and economically and show more finish and bloom than those not creep fed.

Using a variety of feeds in the creep ration increases consumption and gains. Oats and bran can be used first, then gradually they can be reduced and corn added when lambs are about three months old. Soybean meal makes the ration more appetizing. But it is not needed to meet protein requirements if good legume hay is fed.

Research at the Dixon Springs (Ill.) Station has shown that lambs prefer soybean meal over linseed or cotton seed meal.

Some of the best sheepmen produce Choice lambs on grass but this requires excellent pasture and careful management. Wait until pastures are at least 6 inches high before grazing. To prevent too close grazing, use a moderate stocking rate.

Where possible, you should rotate pasture at two week intervals to provide fresh pasture and control parasites. Try to provide a variety of forages by seeding a mixture or using several pastures. You might put a lamb creep out in the pasture to keep the lambs growing as fast as possible.

Check for Ticks and Lice

Parasite control is an important part of the sheep management program. Make a careful check for ticks or lice at shearing time. If parasites are found, treat both ewes and lambs and move them to clean quarters.

Every basic part of our modern automobile was invented abroad. Our contribution has been mass production and interchangeable parts.

Internal parasites also present a problem with sheep—especially in large flocks. Drenching ewes about one week before going on pasture usually proves effective. Big, thrifty lambs that will make the early market don't need to be drenched. If you're not experienced at drenching, get help from someone who knows how to do this important job.

In recent years, many top lamb producers have found they could gain from joining with other sheepmen in their area and forming a lamb pool. In this sales program, lambs are graded and sold. Larger volumes consigned to lamb pools attract more buyers. But even in lamb pools, top quality lambs marketed early are needed to bring top prices.

Killer for Weeds in Soybeans

Timely use of the rotary hoe proved best in tests. In this article, three Iowa scientists report to you.

Condensed from Iowa Farm Science

C. R. Weber, D. W. Staniforth, W. G. Lovely

HOW often have you heard, "Use the rotary hoe on soybeans and treat 'em rough?" You may be tired of hearing it, but this is good advice. The rotary hoe really kills weeds.

Up to now there has been little research information available to tell us just how effective the rotary hoe is in terms of weeds controlled, the resulting bean yields and how economical the rotary hoe is compared with other methods. This article presents some answers from Iowa research.

Our Tests . . .

Our experiments were conducted at Ames, mostly on silty-clay loam soils from 1955 thru 1957. To maintain good growth of soybeans and weeds, we applied supplemental irrigation water as needed during dry spells. Row-planted beans were seeded at about 1 bushel per acre in rows 40 inches apart. Solid-planted beans were seeded at about 2½ bushels per acre in 7-inch drill rows.

We were concerned with annual weeds—mostly foxtail, pigweed and buttonweed. To get a heavy infestation of weeds, we seeded foxtail immediately after the beans were planted. Then we performed the treatments, shown in tables 1 and 2. A 2-row, tractor-mounted rotary hoe was operated at 10-12 miles per hour, with sufficient weights to give desired soil penetration.

Timely rotary hoeing means that the treatment was made when the soil was slightly crusted and when the majority of the weeds had not yet emerged (weeds in white). Rotary hoeing was considered untimely if the majority of weeds had one to three leaves or more. In row-planted beans, good cultivation was done with a tractor-mounted, 2-row, sweep-type cultivator. "Wet after" means that about ¼ inch of water—to simulate "a little rain"—was applied after

Reprinted from Iowa Farm Science, Iowa State College, Ames, Iowa

each rotary hoe operation on solid-seeded beans. CDAA (Randox), a relatively new herbicide useful primarily for control of annual grass weeds, was applied at suggested rates as a pre-emergence spray on row-planted beans.

Row-Planted Basis:

The 2-year results from experiments on row-planted beans are summarized in table 1.

Bean yield per acre from cultivation plus hand weeding (41.9 bushels) was not very different than from hand weeding alone (41.1 bushels), indicating that cultivation itself did not lower yield. The timely rotary hoeing plus cultivation treatment yielded (40.8 bushels) nearly as well as hand weeding (41.1 bushels) and considerably higher than cultivation alone (34.8 bushels). CDAA plus cultivation gave a bean yield (38.1 bushels) considerably higher than cultivation only but a little lower than untimely rotary hoeing (39.2 bushels).

The number of soybean plants per foot of row was decreased 9 per cent by timely rotary hoeing as compared with hand-weeded plots. Though this stand reduction, as such, had no effect on yield, the treatment that caused it resulted in the control of over 6 times more weeds than cultivation alone. Per acre yield of mature weeds (dry matter) was highest with the cultivation treatment (764 pounds) and lowest with timely rotary hoeing plus CDAA plus cultivation (22 lbs.), which almost eradicated weed growth completely.

Now let's look at a few treatment comparisons in the separate years. Cultivation alone did not effectively control weeds in 1956 (1,250 pounds of dry matter per acre) and reduced yield to 30.1 bushels per acre compared with 41.2 bushels per acre for hand weeding. In 1957, however, cultivation alone controlled weeds reasonably well (277 pounds per acre) and resulted in

TABLE 1. Mean soybean yields, stands and weed weights from row-planted soybeans at Ames, Iowa, 1956-57.

Weed control treatments*	Soybeans		Weeds
	Yield (bu./A.)	Plants per ft. of row	Dry matter (lbs./A.)
Cultivation + hand weed	41.9	6.9	0
Cultivation	34.8	6.9	764
Rotary hoe (timely) + cult.	40.8	6.4	122
Rotary hoe (untimely) + cult.	39.2	6.6	301
Rotary hoe (timely) + CDAA + cult.	42.3	6.4	22
CDAA + cult.	38.1	7.0	414
Rotary hoe (untimely) + CDAA + cult.	41.6	6.6	110
Hand weed	41.1	7.0	0

*Two cultivations were performed where cultivation is indicated. Rotary hoe (timely) was done 3 times. Rotary hoe (untimely) was done 1 time. CDAA applied at 4 lbs./A.

little reduction in yield—39.4 bushels per acre compared with 40.9 bushels per acre for hand weeding. These differences occurred because of heavier weed infestations and poorer cultivation in 1956 compared with 1957. The rotary hoe controlled fewer weeds in 1957 than in 1956 when heavier weed infestations were present. CDAA effectively controlled foxtail in each year but failed to control broadleafed weeds.

Solid-Seeded Beans:

The 3-year results from experiments with solid-seeded beans are summarized in table 2.

Bean yield per acre from timely rotary hoeing was 10 bushels higher than from untimely rotary hoeing. Results from timely rotary hoeing plus "wet after" indicated that rain following timely rotary hoeing by no means nullified the weed-killing effect of the rotary hoe.

Numbers of soybean plants per square foot were decreased 12 per cent by timely rotary hoeing, but this decrease in stand was unimportant inasmuch as 3.5 times more weeds were controlled compared with no rotary hoeing. We harvested 472 pounds of weeds per acre from plots receiving timely rotary hoeing compared with 1,659 pounds per acre from plots with no rotary hoeing. Yield of weeds for other treatments was about 1,000 pounds per acre or a little more.

Some Costs . . .

Weed control in any crop should be considered from both an economical and practical point of view. On the practical side, the rotary hoe is a fast, easy-to-use tool which can destroy millions of small weeds in either row-planted or solid-seeded soybeans. It is best used timely, "when the soil is right, and the weeds are in the white." These studies showed, however, that even untimely rotary hoeing was beneficial. But it was less effective in weed control than the timely use of the rotary hoe.

The lowest relative cost for each bushel of extra beans favored use of the rotary hoe. On

TABLE 2. Mean soybean yields, stands and weed weights from solid-seeded soybeans at Ames, Iowa, 1956-57.

Weed control treatment*	Soybeans		Weeds
	Yield (bu./A.)	Plants per sq. ft.	Dry matter (lbs./A.)
Rotary hoe (timely) + hand weed	38.1	6.4	0
Rotary hoe (timely)	34.2	5.9	472
Rotary hoe (untimely)	29.2	6.6	1033
No rotary hoe (check)	23.9	6.7	1659
Rotary hoe (timely) + wet after	31.8	5.6	1113
Rotary hoe (untimely) + wet after	27.8	6.3	1245

*Rotary hoe (timely) was done 3 times. Rotary hoe (untimely) was done 2 times.

the average, this cost for each extra bushel with the rotary hoe was about 4 times less than for the herbicide treatment. In addition, in the solid-seeded beans, we assumed the CDAA treatment would control weeds completely. But it didn't control broadleafed weeds.

The Hoe's Job . . .

In most of these experiments, we obtained a heavy infestation of foxtail. In addition, there was some pigweed and buttonweed plus a scattering of other kinds of annual weeds. Most annual weeds germinate in the upper inch of soil. Large-seeded crops such as soybeans usually are planted deeper and send their roots deeper than most annual weeds. Thus, the main purpose of a shallow cultivation implement such as the rotary hoe is to disturb the weeds without appreciably disturbing the crop.

We accomplished this job through timely rotary hoeing. We didn't kill as many weeds with untimely rotary hoeing because the weeds had become anchored and too big. We obtained the most effective and biggest kill of weeds with the first timely use of the rotary hoe.

Suggestions . . .

After you have obtained a good stand of soybeans, the following suggestions will help produce a good, clean crop. For economical and practical control of annual weeds in row-planted or solid-seeded soybeans, the timely and effective use of the rotary hoe (or other shallow cultivation tool) to destroy small weeds is basic. This may be repeated 1 to 3 times. In row-planted beans a follow-up with one or two shovel cultivations will be necessary. Sometimes wet weather will hamper the effectiveness of the rotary hoe. But these studies indicated that wet conditions either before or after timely rotary hoeing made this operation more effective than untimely rotary hoeing.

The Araucana chickens of South America lay eggs with blue shells.

In general, herbicides for weed control in soybeans should be considered as supplements to good cultural practices—not as substitutes. And at present, herbicides don't appear to be a very economical supplement for cultural practices. This does not mean that future soybean herbicide technology may not develop better herbicides at competitive prices comparable with weed control costs using cultural implements. If you have a very weedy field where cultivation has failed and you wish to try a herbicide, Alanap or Randox applied as pre-emergence sprays at 4 pounds per acre are among the best we have tested.

Good Silage Is Put Up Fast

Efficient silage making and good ensiling go hand-in-hand. Harvest fast and make good silage . . .

Condensed from Crops & Soils

W. K. Kennedy, Cornell University

MAKING good silage is easy. The simple rules are these: Cut, chop, and ensile rapidly.

Rapid and complete exclusion of air is essential for quality silage. Keep this in mind when planning your silage program. Whether you chop, wilt, or use a preservative depends upon the kind of silage, its maturity, the moisture content of the crop and the type of silo.

Legumes pack more easily than grasses if both are cut at the same stage of maturity. They are more succulent, the stems crush more easily, and the leaves and stems are less springy. A legume forage can be ensiled long if cut early and compacted well with a heavy tractor, but chopping is desirable. Chopping is almost essential even for early cut grasses.

Mixtures of grasses and legumes are intermediate in ease of packing. If the forage mixture is cut very early and packed well, and if it contains at least 50 per cent legume it is probably safe to ensile without chopping. Chopping is recommended for mixtures with less than half legume because it eliminates much of the risk of not getting the forage well packed.

Young forage is succulent and easy to bruise; mature forage is tough and fibrous. Young legumes may be ensiled long or with just enough chopping to make them easy to handle. Legumes at the full bloom stage should be chopped to an average length of ½ to ¾ inch. Even young grasses generally benefit by chopping. Once they have headed, fine chopping is essential. It is not advisable to ensile forage grasses such as orchardgrass, brome, or timothy after the early bloom stage. Rapid and complete exclusion of air from these grasses is difficult and sometimes impossible, even when

Reprinted by permission from What's New in Crops and Soils, 2702 Monroe St., Madison 5, Wis.

the chopper is set to cut as fine as possible.

Succulent forage bruises easier and packs tighter than wilted forage. The advantages of wilting a young high moisture crop can be lost by poor packing. Wilting is beneficial to high legume forage up to the midbloom stage. Wilted forage must be chopped fine and should be topped off with 3 or 4 feet of unwilted material. Grasses should not be wilted even when cut early. It is better to lose some juice than to have all the silage inferior because air could not be excluded from the wilted material.

Tower silos favor good compaction. The tremendous weight of a tall column of forage compresses the mass and forces out the entrapped air. Rapid filling will hasten the exclusion of air. In stack, trench, and other horizontal silos, depth of forage alone is not great enough to insure tight packing. Horizontal silos should be filled with succulent forage that packs easily. In addition, a heavy tractor should be driven back and forth over the forage as it is ensiled and for 2 or 3 days after silo filling is completed. Unless such special precautions are taken, rapid compaction does not occur in horizontal silos.

Respiration of plant cells and many microorganisms can continue at a rapid pace as long as oxygen is available. A new supply of oxygen can keep diffusing into the forage when it is loose and fluffy. Respiration produces heat, and the temperature of the silage rises very rapidly. Temperatures of 120 to 150 degrees F. are common in poorly packed forage. These high temperatures cause the silage to turn dark brown; in some cases it is charred black. The forage may lose 50 per cent of its nutrients.

Less oxygen moves into partially packed forage, and heating is not as severe. The silage becomes warm but not hot, and eventually it cools down. But when the silo is opened, top and side spoilage is extensive. Spots of moldy silage may occur within the mass and loss of dry matter is high.

The harmful effects of air are not always so spectacular or as easy to detect as just described. Small amounts of air trapped and penetrating into properly compacted silage will cause losses even though no visible mold growth or excessive heating is detected.

The importance of promptly excluding the air was demonstrated recently by making silages from chopped young orchardgrass and chopped young alfalfa. Each type of silage received the following pressure treatments: (1) 5 pounds per square inch pressure immediately

after ensiling; (2) no pressure for two days; (3) then 5 pounds per square inch.

Dry matter loss and strength of acids and bases were lower when the silage was immediately compressed than when the pressure was delayed. Alfalfa leaves in the silage that had been compressed immediately were firm and sound. Individual leaves could be separated out and recognized. The leaves deteriorated considerably when the pressure was delayed; they felt slimy and could not be separated from each other because they were so soft and easily torn.

In another study, a mixture of alfalfa and timothy was ensiled as long and as chopped forage. Pressures of 5 pounds per square inch were applied immediately to both. The chopped forage, which was more closely compacted, produced a silage with a pH of 4.0 and a loss of dry matter of 9.0 per cent. The unchopped forage, which contained more trapped air, had a higher pH of 4.6 and a dry matter loss of 24.8 per cent. The latter silage was slimy and strong smelling.

Chopping and bruising facilitate rapid and thorough compaction. This may be their only benefit, but it appears that the rapid release of plant juice favors a lactic acid fermentation. Quick production of lactic acid lowers the pH level and prevents undesirable fermentation from occurring.

Many advantages of large-scale dairying are lost unless a relatively high level of production per cow is maintained, say extension dairymen.

Long and chopped young leaves of orchardgrass and white clover were ensiled under a pressure of 7 pounds per square inch —equivalent to placing a sample under 20 to 25 feet of settled silage. Rapid exclusion of air must have occurred. Juice flowed from both the long and chopped white clover within 5 minutes after ensiling. Within 10 minutes, juice flowed from the chopped orchardgrass but no juice flowed from the unchopped orchardgrass until the following day.

The silage from both treatments of white clover was excellent in color and odor. The pH of both silages was 4.0. The total loss of dry matter was 23 per cent, and 13 per cent of the dry matter was lost as juice. Wilting of such succulent material is desirable to prevent excessive juice losses.

The silage from chopped orchardgrass also was excellent. The pH was 3.9 and the loss of dry matter was only 7 per cent. The unchopped orchardgrass had a

pH of 4.6. The quality was fair but a distinct off-odor was detectable. The concentration of volatile acids and bases was higher than for either the clover or chopped orchard grass silages. The loss of dry matter was 17 per cent.

These results emphasize the importance of chopping all forages that are not extremely succulent. The only benefit might be better compaction, but probably in addition, the quick release of plant juices coupled with good compaction hastens the formation of lactic acid.

Fertilizer prices increased only a small amount in the past 20 years, while the average cost of all other farm production items rose nearly 2½ times.

Numerous experiment stations have studied the value of silage preservatives but have reached no general agreement as to their benefit. One reason for the lack of agreement is the wide differences in research methods used.

In many cases preservatives have been evaluated by ensiling forage in relatively small silos. The capacity has varied from a few pounds to 1 to 3 tons with little or no provision for applying additional pressure. In such cases enough air is excluded to prevent visible mold growth, but the mass of forage is not large enough to obtain rapid and complete exclusion of air. Considerable deterioration occurs in the presence of even small amounts of air and the loss of dry matter is high.

Preservatives, especially one like sodium metabisulfite, which helps to block the deterioration in the presence of limited amounts of air, are quite effective. Under these conditions bisulfite may decrease the loss of dry matter by 7 to 10 per cent. If the supply of air is cut off by completely sealing the container or by applying pressures comparable to these in large silos, the benefit of the preservative is drastically reduced. The higher loss for forage under pressure compared to the forage in a small sealed container is largely accounted for by the loss of juice when pressure is applied to succulent forage.

Similar results were obtained when immature red clover was ensiled in small containers under a pressure of 5 pounds per square inch and when ensiled in a 50-ton silo. If air is effectively excluded by rapid filling of the silo, there is little need for a preservative. A preservative is helpful when good compaction is not possible and for use on the top layers of silage.

It should be remembered that while a preservative will help compensate for poor packing, it does not eliminate all the losses associated with incomplete exclusion of air. The loss of dry matter was greater for treated forage without complete exclusion of air than it was for untreated forage with complete exhaustion of air.

Efficient silage making and good ensiling practices go hand-in-hand. With modern equipment, it is possible to harvest large tonnages in a day. The combination of rapid filling and even distribution is an effective means of excluding air. Harvest the crop as fast as possible and make good silage.

Large Dairy Herd Facts

Cow numbers are no assurance of profits in the dairy business, according to G. A. Williams, Purdue University dairyman.

A study of Dairy Herd Improvement Association records in an eastern Indiana county, shows that wide variations may exist between different herds in the county. The five high herds contained a total of 84 animals. These dairymen were more interested in net returns than the volume of output. The average milk production was 11,802 pounds for an average feed cost of $128 per cow. After paying the feed bill the average income above cost of feed was $376 per cow.

The five herds having the lowest production, 6,844 pounds of milk per cow, contained 143 cows. Their average feed cost was $116 each or $12 less than the top herds and their return above feed cost was $196. Thus for an extra $12 per cow spent for feed, the dairymen at the top of the list received $180 more per cow. For each dollar spent for feed, there was an added return of $15.

Th difference between the performance of the two groups is even more marked if totals are compared.

The 84 cows produced 991,368 pounds of milk which exceeded the production of the 143 cows by 12,676 pounds. Their annual feed bill was $5863 less than the other group, but the income was $4216 more.

At the time when dairy cow owners are considering an increase in the size of their herds, they may afford to study the comparisons which these groups provide. The size of the herd is no assurance of net returns. One cow producing 10,000 pounds of milk, Williams points out, returned almost as much income above the cost of feed as six cows averaging 4,200 pounds of milk.

New Methods, Materials, Fight Weeds

A comprehensive report on the latest in chemical weed control . . .

Condensed from Michigan Farmer
B. H. Grigsby, Michigan State University

ANNUAL losses due to weeds are estimated to be between 3 and 5 billion dollars. This indicates a weed bill of about $500 per person for our entire farm population or about $30 per person for the total population of the U. S.

Weed losses are found in decreased yields, lowered quality, increased cost of production, higher rates of seeding, livestock poisoning and medical expense for more than 5 per cent of our population. In crops such as wheat and corn, weeds cause losses equivalent to about 10 per cent of the cash value of these crops each year.

Research on the use of herbicides, since 1944, has been expanded to include almost every weed problem in crop production. Results have led to practices which, if used in all crops, could reduce our annual weed loss bill by at least 50 per cent. However, only about 10 per cent of our crop land is under any kind of weed spray program.

First Came 2,4-D

One of the earliest weed spray methods developed was the use of 2,4-D as a selective spray for broad-leaved weeds in corn. This method of weed control is more or less a standard practice in much of the corn belt but does not solve the annual grass problem in corn. Experiments with new materials and new techniques of application indicate that control of grasses in corn is possible.

One of the newer practices in corn production is that of minimum tillage. In this method plowing, seed bed preparation, and planting are done as a single operation. This system leads to more weed growth in the corn row than usually occurs in the space between rows, therefore the need for weed sprays is increased.

The problem can be solved easily by applying a suitable herbicide as a part of the plow-plant operation. A spray boom mounted on the seeder unit can apply 1 to 2 pounds per acre

Reprinted by permission from Michigan Farmer, East Lansing, Michigan

of 2,4-D ester either as a band over the row or as an overall spray. This application, except on very light sandy soils, will give excellent control of all weeds and will not affect corn emergence and following growth. Cultivation usually will not be needed for a period of 4 to 6 weeks, thus it is possible to produce a good corn crop with no more than one cultivation.

Number of milk cows two years old and older on U.S. farms on January 1 was 22.4 million head, the lowest number since 1928.

A similar technique is used in field bean and soybean production. Application of either DNBP or NP at planting time has been very effective in these crops.

One important feature of these early applications of herbicides is that the chemical is placed on the soil and remains there as a residue which destroys weed seedlings as they attempt to emerge, while the crop seeds are germinating at a greater depth in the soil and are not affected by the herbicide. This is important because the young crop plants are not in competition with weeds in the early stages of growth and have use of all the available moisture and fertilizer. The lack of weed growth removes the need for early cultivation and thus prevents soil compaction from heavy equipment. The loose soil tends to reduce the amount of weed emergence later in the growing season.

New Herbicide Forms

Within the last 3 years a great deal of work has been done with granular herbicides. These are formulations of materials, usually applied as liquid sprays, on lifeless materials such as clay granules, vermiculite particles, etc. Granular herbicides are applied dry by means of grain drills, fertilizer spreaders, seeders and other devices which will give uniform scattering of the particles. This method of application permits the use of herbicides in a number of crops where liquid sprays cannot be used because the herbicide does not stick to the leaves but drops to the soil and there functions as a preemergence application with respect to germinating weed seeds. Successful use depends upon starting with weed free soil near planting time or immediately after a regular tillage operation.

The absence of foliage contact permits a wide extension of herbicide use in crops which have little or no tolerance for foliage sprays. However, when a crop is known to be subject to injury from root absorption of a given herbicide some care in timing and rate of application must be used.

Granular herbicides appear to be most useful in certain vegetable crops in nurseries and around established ornamental plants. 2,4-D, CIPC, DNBP and NP are some of the herbicides which have been prepared for granular application. Selective activity of such formulations is based on inactivity of the material until it reaches the soil and there is released slowly by the dissolving action of soil moisture.

The production of new herbicides is a natural result of research in the field of weed control. These new materials often are more selective than older products and frequently they are more specific in their action. This may be shown by the fact that a compound may be used in only one or a few closely related crops, or by the fact that a formulation is highly effective on a particular specie of weed.

One of the more important new herbicides is 2,2-dichloropropionic acid, commonly known as dalapon. This chemical is primarily a grass killer when applied to the top growth of grasses. A few broad-leaved crop plants are injured by direct contact with dalapon and some, beans and seedling legumes, may be killed by small amounts of dalapon left in soil from a previous treatment for grass control. This effect may be observed 2 to 4 months after the original application.

Dalapon is used for the control of quackgrass and can be applied at any season when the grass has at least 4 inches of new growth. The customary rate of application is 10 to 20 pounds per acre. However, in some cases better results are obtained when the total dosage is split into 2 or 3 applications spaced about 2 weeks apart. Late fall—October or November—is a suitable time for dalapon application and permits use without endangering most field crops. Areas treated in the fall can be planted to most crops the following spring.

Fertilizer injury can be eliminated by following soil test recommendations.

Can Clear Ditches

Control of cattail and various grasses, sedges and rushes in drainage ditches can be accomplished by spraying with dalapon. A concentration of 15 to 20 pounds per 100 gallons of water applied as a wetting spray has given complete top kill of cattail and prevented regrowth in the season following spraying. Best results are obtained from sprays applied in June or July on cattail growing in shallow—6 to 12 inches—water or in areas where no surface water was present at the time of spraying.

Canada thistle has long been a problem on many farms. Road-

sides, fence rows and ditch banks generally have considerable thistle. Grain fields, pastures and corn also may be infested with Canada thistle. Some temporary top kill can be obtained by applications of 2,4-D but the effects seldom last for an entire seasan. A new herbicide, Amino triazole (Amitrol) has been much more effective on thistle than has any other herbicide. When 4 pounds of amitrol have been sprayed on Canada thistle plants, at any stage prior to flowering, excellent control can be expected. Applications in both spring and fall have been successful.

The yak, a buffalolike animal, is a source of milk for the Tibetans.

Amitrol is likely to cause some injury to alfalfa, clover and small grains; therefore treatment of thistles in these crops probably should be confined to patches where the weed is expected to seriously interfere with the yield. In such cases control of the weed is more important than any additional loss that may be caused by the chemical.

In corn, amitrol applied as a lay-by spray has been effective on patches of thistle and on horse nettle. These late applications appear to have no effect upon corn yields.

Another important use for amitrol is in the control of poison ivy. A concentration of 2 pounds amitrol in 100 gallons of water applied to ivy when the leaves are fully grown is highly effective. Other woody growth, trees, shrubs, vines, etc., is tolerant of the spray but the spray should be confined to the ivy in so far as is possible.

The control of yellow rocket in alfalfa by late fall, November, spraying with MCP has been widely accepted by Michigan farmers. Equally good results on spotted knapweed and wild carrot can be obtained by late sprays of the ester form of 2,4-D. The effects of fall spraying are never as spectacular as are those obtained in the spring but the end results, destruction of biennial and perennial weeds, are identical. Fall spraying has the distinct advantage of much less risk of crop damage by accidental spray drift.

A number of new herbicides which have not been sufficiently tested to permit making suggestions for use offer considerable promise in a number of weed problems. Among these compounds are trichlorobenzoic acid derivatives, simazin and neburon.

The trichlorobenzoic acid materials may be useful in the control of a number of perennial weeds, field bindweed in particular, and may find some use as pre-emergence sprays in corn.

Simazin for Corn

Simazin is a compound which has long residual toxicity for weed seedlings in treated soil. The compound is not toxic to corn at rates of 2 to 4 pounds per acre, which will give weed control for an entire season. Higher rates of application are of value for the control of all vegetation in areas where crops are not being grown. Effects for more than one season may follow the use of simazin, therefore some care in selecting areas for treatment is advisable. Simazin is effective on grasses as well as on broad-leaved weed species.

Neburon, a compound related to the older herbicide CMU, has shown some promise as a pre-emergence herbicide for use in forage legumes. However, more data are needed with respect to rates and legume crop responses before this compound comes into general usage.

Sugar beet growers have long needed herbicides for the control of grasses and broad-leaved weeds in this crop. Fair results can be obtained on grasses by pre-emergence application of 5 to 8 pounds per acre of either TCA or dalapon but these herbicides do not give satisfactory control of broad-leaved weeds.

In 1958, a compound known as endothal will be available for broad-leaved weed control in beets. This herbicide may be applied as a pre-emergence spray or, at lower rates, as a post-emergence spray. Sugar beets are not affected seriously by endothal and we can expect considerable use of the compound.

Many of the methods and materials described above are very new but they have potential usefulness that can make as much of a change in weed control practices as did 2,4-D when it became a widely used herbicide some 10 years ago. The continual discovery through research of new, highly effective, highly selective herbicides and the parallel development of new and better methods of application should enable our farmers to make substantial reductions in our high annual weed bill.

Higher Cane Yields

Average sugar cane yield in Louisiana increased from 17.3 to 24.5 tons per acre in the past five years. This is considered to have been caused largely by greater control of Johnson grass through use of chemicals and the practice of fallow plowing. Johnson grass control makes possible much more effective use of fertilizers. Fallow plowing also gives better soil preparation. Development of improved varieties also has contributed to the increase in production.

American Agriculture in 1965

There is little chance that we can eat up our surpluses. In fact, they may grow larger . . .

Condensed from
Michigan Farm Economics

James T. Bonnen

CONTINUING, not temporary, overproduction plagues American farming today. Since 1949, with the exception of the Korean War period, farm production has annually exceeded domestic and export needs by an average of 8 per cent.

The largest excess of production has occurred in the food grains (primarily wheat), where production has exceeded needs by 50 per cent. Next largest is cotton with a 20 per cent average yearly imbalance; feed grains and oil seeds have exhibited an annual imbalance of 10 and 9 per cent respectively. Tobacco production has averaged 6 per cent more than consumption. Dairy products have averaged a 4 per cent excess per year.

What are the chances of closing this gap between use and production by 1965? If there is no war or major depression, consumption per capita can be expected to grow about 4 per cent while population should reach 190 million persons by 1965. These factors combine to lift total food use about 20 per cent between 1955 and 1965.

Production Increases to Continue

Crop yields and feeding efficiency are expected to increase from 25 to 30 per cent over the next 10 years. Increases twice as large as this are possible. However, if demand rises only 20 per cent while yields and feeding efficiency expand 25 to 30 per cent, it is clear that agricultural resources will have to be shifted toward more extensive uses and some inputs reduced or the nation will face even greater overproduction.

(Editor's Note: The word, input, as used in this article means the putting-in or application of land and capital to agricultural production.)

This is all the more obvious when one considers the large surplus stocks and the excess pro-

Reprinted by permission from Michigan Farm Economics, published by Michigan State University, Lansing, Michigan

duction capacity of 8 per cent per annum already in existence at the beginning of the decade 1955-1965. If there are no adjustments in resource inputs, an 8 per cent excess of capacity combined with an increase of 25 to 30 per cent in yields and efficiency of feed utilization will result in an output of farm products 15 to 20 per cent in excess of 1965 consumption levels.

Separate banding of seed and nutrients is the best insurance against "burning" wheat with fertilizer, according to Michigan State University soils specialists.

This is a clear indication that the pressure of the "surplus problem" is growing and is likely to continue growing through 1965.

Before an equilibrium can be obtained, important inputs will have to be reduced and reorganized. Cropland will have to be shifted to pasture uses reducing harvested acreage by about 11 per cent or to below 300 million acres. In general, far more extensive use of land inputs is necessary. The farm labor force will very likely have to be reduced from the 1955 level of 6.7 million persons to slightly below 5 million by 1965.

Reducing Land Not Enough

Attempts to balance farm production and consumption simply by moving large amounts of one resource, such as land, out of agricultural production are doomed to failure. Other resources are simply substituted for land and identical or even higher levels of production result.

The same may be said for proposals that see a solution in moving only labor out of agriculture. The substitution of capital for labor and land has been a characteristic feature of agriculture's technological and organizational revolution. Indeed, it appears that restrictions on land inputs have, in some cases, accelerated this revolution.

Due to these pressures on agriculture and the resulting changes, the number of farms in the U.S. will probably decline from 4.7 million in 1955 to slightly fewer than 4 million by 1965. The average size of farm will increase 20 to 25 per cent. The family farm will still characterize American agriculture.

Let's examine some of the pressures being placed on the future balance between production and the consumption of *particular* farm products:

Crop yields and the efficiencies of feed utilization are expected to increase 25 to 30 per cent over the decade 1955-1965. This involves an increase of 32 per cent in cotton yield, 11 per cent in wheat, 24 per cent for corn, 43 per cent for grain sorghums, and

24 per cent for soybeans. Efficiency of feed utilization can be expected to increase about 12 per cent in feeder cattle production, 8 per cent in hogs, 5 per cent for egg production, and 10 per cent for poultry meat.

These increases are due only in part to: (1) the technologies of genetic improvement; (2) more complete use of improved pesticides and fertilizers; and (3) other technical innovations.

Of equal or greater importance are (1) the organizational changes, such as a continued shift toward the more efficient areas of production; (2) further specialization of farm enterprise; (3) more complete adoption of continuous materials handling as the size of the farm enterprise increases; and (4) changes in both the management function and in the capital and credit structure due to vertical integration.

It is easy to see that the supplies of farm products are still likely to be excessive in 1965 unless very significant changes are made in the organization and intensity of the use of resources going into agricultural production.

Consumption Will Increase Too

Total consumption is expected to expand by 20 per cent between 1955 and 1965. This is mainly the result of having 15 per cent more mouths to feed. In addition, per capita consumption will expand. With no war and no depression, we can expect a 25 per cent growth in income per person. This greater income combined with expected changes in tastes will bring about a net increase of 4 per cent in the per capita consumption of food.

Feeding colostrum — first milk which the cow produces after birth of a calf — is an excellent means of preventing bacterial infection in young calves, say Purdue University dairymen. Feeding trials have been conducted by confining calves at birth in individual pens and feeding colostrum by hand. All the colostrum of the dams is saved, placed in plastic bags and stored in a deep freeze until needed. A mixture of one-half colostrum and one-half skim milk fed for 21 days has given good results.

However, consumption per person varies widely by commodity. Significant per capita increases are expected in livestock and poultry consumption. The per capita consumption of chickens can be expected to increase 32 per cent and turkeys 24 per cent. Eggs will increase 6 per cent. Beef and veal consumption per capita will expand 7 per

cent, while pork expands only 1 per cent.

No expansion can be expected in lamb and mutton consumption per person and the per capita consumption of all dairy products will likely decline about 5 per cent. Major declines will occur in wheat, potatoes, and tobacco consumed per person.

We have no way of evaluating the impact of many technological innovations. These include such possibilities as: (1) applications of atomic energy which may or may not come to fruition by 1965; (2) the use of solar energy; (3) artificial photosynthesis; (4) economic production of fresh water from sea water; (5) applications of growth regulators such as gibberellic acid to crop and pasture production; and (6) microwave and radiation techniques of food preservation.

At present it is not possible to know the extent and impact upon agriculture of vertical integration. Partial allowance has been made in the estimates of livestock feed utilization efficiencies, but a rapid pace of vertical integration, such as occurred in the broiler industry, would result in much higher efficiency estimates, particularly for hogs.

A continued imbalance between production and consumption appears to be the most likely occurrence for 1965. The major imponderables in the situation are war, depression, and explosive technological innovations that are impossible to anticipate accurately today. Whatever are the uncertainties, it is clear that for 5- to 10-year policy-planning purposes, we must consider the present surplus of production as a continuing, *not a temporary problem.*

Vernal Least Damaged by Frost

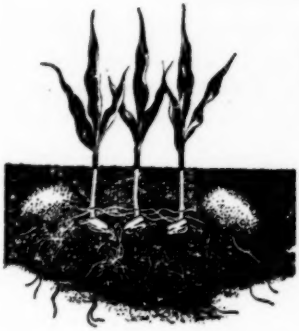
Chalk up another advantage for Vernal, the new alfalfa variety. Tests by University of Wisconsin agronomists show that Vernal was not damaged as badly as other varieties by the spring frosts which occurred in some parts of the state in early May last year.

Ranger was heavily damaged by the frost. Other varieties tested were DuPuits, Grimm, Narragansett, and Buffalo.

The frost occurred when the alfalfa was 6 to 8 inches high. Leaves were frosted to the extent that they drooped and turned yellow. Many dried up and dropped from the plants. Some stem ends were frosted so badly they eventually dried up. Such frosted plants are set back, but will come back from new growth.

—*Wisconsin College of Agriculture*

Insecticide Protection for Your Corn



How to get cheap insurance against corn rootworms, seed insects, wireworms and cutworms . . .

Condensed from Nebraska Farmer

Bob Roselle

INSURANCE against soil insects of corn is probably the cheapest insurance that corn growers can provide for their crops. Unprotected corn is subject to the ravages of numerous soil insects.

Rootworms and white grubs attack the root system, resulting in decreased yields. In addition to reduced ability of corn plants to take the nutrients and water from the soil for a good yield, the stalk may be poorly anchored and lodge during storms, or be broken over at picking time, resulting in harvest losses.

Seed corn maggots, corn seed beetles, and wireworms attack the seed. Wireworms will also damage plants that may survive a seed attack. Fields heavily infested with these insects usually fail to produce a good stand.

Several kinds of cutworms attack corn. They do their dirty work at night, hiding under the soil surface during the day. They cut small corn plants at the soil line, leaving the plants to wither and die. Damage is usually quite heavy before their depredations are noticed.

Infestations of corn rootworms are more severe in corn fields that have been in corn 2 or more years, especially irrigated corn. Wireworms, and white grubs are more apt to be damaging when corn is planted in sod ground or grassy fields the first and second year. Cutworms may attack any corn but especially in fields that follow alfalfa, and low, moist fields.

Until recently the control of soil insects of corn consisted mainly of crop rotations and

Reprinted by permission from Nebraska Farmer, Lincoln 1, Nebraska

prayers. During the last decade several insecticides have been developed which provide control of soil insects. Most of them are economical and provide the insurance a farmer needs for his corn crop.

Corn Rootworms

In Nebraska, corn rootworms have been the most important and universal soil insects of corn. Three kinds occur, the southern (spotted cucumber beetle), the western and the northern. Soil insecticides will control all 3 kinds. Application of insecticides may be done by broadcast, row, or fertilizer-insecticide mixture applications.

Broadcast applications can be made with boom-type sprayers, or by airplanes. For satisfactory results the spray must be disked into the soil as soon as possible after application to avoid evaporation. Sprays must be applied on calm days to prevent wind drift.

Three insecticides are recommended; they are: aldrin at the rate of 1 pound actual aldrin per acre (1 quart of 4 lbs. per gallon emulsion); heptachlor at the rate of ¾ pound per acre (3 pints of 2 lb. per gallon emulsion); and BHC at the rate of ¾ pound per acre (3 quarts of 1 lb. per gallon emulsion). The insecticide is mixed with 5 to 10 gallons of water per acre and applied evenly.

Row Application

Row applications of aldrin or heptachlor may be made as sprays, granular formulations, or with starter fertilizers. Row sprays are applied by attaching a nozzle so that the spray is applied in the row at the time of planting.

The spray should be adjusted so the fan is about 8 inches wide and directed to the soil in front of the covering disks of a lister or behind the planting shoe of a planter. Apply the insecticide in water at the rate of 3 to 5 gallons per acre. Only aldrin or heptachlor are recommended for row sprays. Use 1 pint of 4 pounds per gallon aldrin, or 1 quart of 2 pounds per gallon heptachlor per acre.

Granular formulations of aldrin or heptachlor are also recommended. They must be applied in special applicators. Granular types of insecticides are easier to use, because no mixing is required. Use a minimum of 2½ pounds of 20% heptachlor or aldrin per acre. Equipment must be calibrated carefully so that the proper amount is applied.

Fertilizer - insecticide mixtures may be used with satisfactory results if applied in the right amount and using a recommended method. Usually they are applied as a band treatment with starter fertilizer. Before considering these mixtures, farmers

should have soil tests made to determine if they actually need the fertilizer; if not, it is not economical to use a mixture to control rootworms—one of the other methods should be used.

If soil tests indicate that starter fertilizers are needed, enough starter should be used to provide ½ pound heptachlor or aldrin per acre as a band treatment. For best rootworm control a split boot should be used so that a band is placed on each side of the row in order to protect both sides of the corn root system.

Seed Insects

Corn rootworm control insecticides, especially row applications of liquid or dry forms, will control most corn seed insects. If rootworms are controlled there is little need of seed treatment with insecticides. If rootworms are not controlled, dieldrin, aldrin, heptachlor, or lindane may be applied to the seed to control seed corn maggots, seed corn beetles, and provide temporary control of wireworms. A 50% wettable powder of dieldrin, aldrin, or heptachlor may be used at the rate of 2 ounces per bushel of seed, or 25% lindane at the rate of 4 ounces per bushel of seed.

If lindane is used it should be applied just before planting to avoid injury to germination, the other insecticides do not harm germination; therefore, may be applied some time before planting. Seed treatment does not provide satisfactory control of corn rootworms.

Wireworms

Wireworms destroy corn seed by feeding on the germ of the kernel, they continue to damage fields by feeding in the stalks of corn plants below the surface of the soil.

Forty years ago it took only 100 horsepower to keep a combat airplane in the air. Today it takes 250 horsepower just to carry a 117-pound female to the supermarket.

Wireworms are usually more severe when corn is planted into sod or grassy ground. Since it requires more than one year for wireworms to mature, corn may be damaged 2 or 3 years by one infestation.

Light infestations likely can be controlled with row treatments as for corn rootworms. If infestations are moderate to heavy, more insecticide should be used, and row treatment applications for corn rootworms should be doubled.

If broadcast applications are used, 3 quarts of 4 pound per gallon aldrin, or 6 quarts of 2 pound per gallon heptachlor should be applied before planting time and disked well into the

soil. This control would be quite expensive.

Seed treatment will help reduce damage by light infestations, but is probably not adequate to combat heavy infestations, due to the fact that wireworms also injure corn by feeding in stalks.

Cutworms

Several kinds of cutworms feed on corn; however, the damage caused by them is similar. Usually damage is first noticed when numerous plants have been cut at or just below the soil surface. The worms never finish eating a plant, they leave the cut plant as evidence of their presence.

Sandhills cutworms which are light colored worms occurring in sandy soils of north and northeast Nebraska can be controlled with endrin 1 pint per acre, or DDT at the rate of ½ gallon per acre in 5-10 gallons of water. Applications should be made when damage first occurs.

Overflow cutworms, which damage corn planted in low fields and bottom land, and other species may be controlled with row sprays or broadcast applications of one of the following insecticides:

Insecticide and Formulation	Amount Per Acre	
	Broadcast	Row
Aldrin, 4 lbs. per gallon	2 quarts	1 quart
Dieldrin, 1½ lbs. per gallon	1 gallon	1-1/3 pints
Heptachlor, 2 lbs. per gallon	1 gallon	½ gallon
Toxaphene, 6 lbs. per gallon	2 quarts	2½ pints

The most economical control is the row spray which is applied with nozzles adjusted to apply the spray in a band about 12-14 inches wide over the corn rows. It is advisable to use about 15 gallons of water or more per acre in order to saturate the soil around the plants to kill cutworms as they crawl through or on the surface of the soil.

Rate of Egg Production Determines Hen's Value

It's important that laying flock owners get replacement chicks bred for top egg production say University of Missouri extension poultrymen, for a hen's labor return is closely related to her rate of lay.

According to the records of Missouri poultrymen taking part in an extension poultry record keeping project, hens averaging 150 to 199 eggs per bird each returned a labor income of 70 cents. Hens that produced 200 to 249 eggs returned $1.07 while those averaging 250 or more eggs returned $2.10 per bird.

Is Agriculture Paying Too Much Taxes?

The farmer's property is quite visible to the tax collector. You are certainly paying your share of property taxes. Are you paying more . . ?

Condensed from
The Nation's Agriculture

Fred Goetsch,
Doane Agricultural Service

TAXES are not a pleasant subject, but certainly one that is much discussed. The many increases in property taxes in the past few years are cause enough for plenty of hot discussions.

For instance in 1955, the taxes on farm and ranch land in Texas were 7.9% higher than in 1954. This is typical of some of the rude surprises that the nation's farmers have faced when they read their tax bills.

There are plenty of reasons why taxes have gone up. New schools and other public buildings have been built. Higher salaries have been necessary for teachers and for public officials. Operating expenses for equipment are all higher because of inflation in the past 10 years.

The Farmer's Share

Most farmers are fair-minded people who are willing to pay their share of taxes for the services they receive from government. However, not many people are interested in paying more than their share—especially when their income has been declining for several years.

In those states where real estate and personal property taxes are the major sources of state and local tax money, the farm people are often paying an unfair share of taxes. And there may well be some severe inequities in assessments between various farms.

This is not always the fault of the assessing officials. The farmer's personal property and real estate are out in the open for all

Reprinted by permission from The Nation's Agriculture, 2300 Merchandise Mart, Chicago 54

to see, while city folks have more "intangible" property. Did you ever try to hide a Jersey bull from the assessor? How can you put 5,000 bushels of corn out of sight when he comes around? There are cases of parcels of land being missed by the assessor, but usually that "back 40" is taxed.

A bank clerk, dictating, was in doubt as to the use of a certain phrase, so he said to his stenographer, "do you retire a loan?"

The wistful-eyed stenographer replied; "No, I sleep with my mother."

City dwellers often have their property in the form of money in the bank, stocks, bonds or perhaps jewelry in the safety deposit box, and otherwise invested in ways that are not readily apparent to the assessor.

The property tax pays a big share of the state and local government costs in many states. For instance 44% of the general revenue in South Dakota was from this tax in 1955. In Nebraska, the property taxes constitute the major source of revenue. This is why it is important for farmers to get a "fair shake" on this matter of property taxation.

What Has Actually Happened

Figures can be dull but if it is your money, perhaps they are more interesting. Numerous agricultural colleges have made studies of property taxes and how they compare between rural and urban areas. Here are a few examples of inequities that we have dug out from various parts of the country:

Missouri

After a study of 12 representative counties and 3 metropolitan areas in 1947, University of Missouri staffmen stated in Research Bulletin 490: "Farms were assessed at an average of 50.35% of their sale price, while town lots were assessed at 26.02% of their sale price. In the rural counties the cost of state and county government weighs almost twice as heavily on farmers as on town property owners."

Illinois

The Extension Service released this information in an article by Professor Norm Krausz: "Farmlands are overassessed compared with urban real estate. In 1953, 78 counties in Illinois were giving the farmer the axe on his farm assessment. In some counties the farmer had his farmlands assessed twice as high as the lots and homes of his city friends."

On personal property, the University of Illinois expert has this to say, "It is frequently said that only 20% of all personal property in Illinois is assessed. This 20% includes farm personal property, which is assessed at close

to market value. Blue books, red books and market prices are used to assess farmers' equipment, trucks, tractors, grains and animals. Taking the state as a whole, farmers make up 8% of the population and pay 33% of the personal property tax."

South Dakota

A study by South Dakota State College shows that in 1954 farmers made up 36% of the state's population, had 28.6% of the income and paid 51.5% of the property tax, plus 50.1% of the sales tax.

South Carolina

Economists at Clemson Agricultural College made a study of assessed values and sale prices on 206 bona fide transfers of rural and urban real estate occurring in 1952. They found that, "the average level of assessment for rural properties was 12.9% of sale value, whereas urban properties were assessed for an average of 6.3% of sale value. In other words, farm real estate in Abbeville County was assessed about twice as high on the average as urban real estate."

Other Considerations

A great deal of the property tax is used for supporting schools. It is hardly reasonable to assume that it costs more to educate the farm children in a consolidated school than it does the town boys and girls. The extra cost of operating school buses is about all that could be charged directly to the farm population.

Many of the services supplied by county and state governments are definitely used more by town and city people than they are by country folks.

Tabbie, a 10-year-old cat, likes the bright lights. She was left on the farm of relatives when the Swande Hallberg family moved away from Duluth, Minnesota. Tabbie hiked 80 miles back to Duluth. She was taken in by new occupants of the home.

The necessary increase in size of the average farm and the livestock and equipment to go with it results in a further distortion of the property tax load per person. In other words, today's farmer must operate more acres to make a living. This means that he must pay more property tax, even though he is getting no more benefits than before. His expensive equipment brings more personal property tax also.

On a group of 544 Michigan farms, the average property tax paid in 1939 was $75. In 1956 the same farms paid an average of $375 — exactly 5 times as much. This was not all due to increased tax assessments. The average size of farm jumped from 165 acres in 1939 to 234

acres in 1956. Of course, they had more machinery and livestock, too.

Agriculture's Subsidy to the City

Every year thousands of farm boys and girls leave the country to take jobs in towns and cities. The entire cost of educating them has been borne by the taxpayers of their local school district. This is one of the soundest reasons in the world why farmers should not be called upon to contribute more than their fair share of property taxes. They are furnishing the urban section of the economy with a steady supply of trained and educated workers.

Don't smoke in bed — the next ashes that fall on the floor may be your own.

What Can Be Done

If you are in a state where an unfair property tax situation exists, what can be done to straighten it out?

Try to shift the tax load in your state from property taxes to other forms. South Dakota economists say that, "Property ownership does not reflect the same ability to make tax payments today, as was the case during the early development of this country."

That state has made progress in this direction. Back in 1926 almost 75% of the general revenue in South Dakota was raised from property tax, while the figure was 44% in 1955. In some states, such as Delaware, taxes on non-farm activities are prominent compared to tax levies on farm real estate. In Michigan, the support of rural roads has been shifted almost entirely from the property tax to the gasoline tax and motor vehicle revenues.

The U. S. Department of Agriculture has pointed out that, generally a smaller percentage of total funds for state and local purposes is now obtained from property taxes. Many state governments are eliminating or limiting their levies on property—leaving this source of revenue to local governments. Often local schools are given so-called state aid that comes from other sources.

Where nothing can be done about reducing the emphasis upon property tax as a source of revenue, the next best thing is to be sure that you have equitable evaluation of property. With so much expansion of suburbs into rural areas, more and more farmers are having the problem of their land being taxed at exorbitant levels because of its possible use for building sites. Often this makes the taxes so high that you can no longer afford to use the land for agricultural purposes.

California has passed a law that all farmland must be assessed on the basis of agricul-

tural use only. At last report the law was not actually being used and farmers around urban areas were still paying through the nose.

Agricultural zoning is one of the best answers to this problem of unusually high values around cities. If the land is zoned for farming only, your values are kept in line with what can be made by farming the land and your taxes are more fair.

Determining the Assessed Value of the Property

When all is said and done, the biggest single problem in fair property tax assessment is the determination of the assessed value of the property. All over the country we have found tremendous variations between the values set on properties that were essentially the same in earning power, location and other things that make up the real worth of a property.

In appraising farm property, you cannot do a good job without carefully examining the productivity of the soil—the basis for most of the earning power of a farm. In the past, very few counties have allowed enough money for a thorough job of evaluation that would result in an equitable property tax load.

There are two main solutions to this situation: (1) The county can authorize your assessor to hire trained, competent men to work under his supervision to set values on all properties at a comparable level, or (2) the local government can hire an outside appraisal firm to come in and do the whole appraisal job for them. The assessor uses the outside appraisal firm's value as a guide in setting the assessments. The property owner, in either case, has access to the local Board of Review who can make adjustments if they feel they are needed.

In the event that you want outside help, you can get the names of competent appraisal firms from Albert W. Noonan, Executive Director, National Association of Assessing Officers, 1313 East 60th St., Chicago 37, Illinois.

Early Cut Forage Reduces Grain Needs

Forages cut for hay or silage at early growth stages contain more energy and digestible protein than when harvested at later maturity, say dairy scientists. The feeding of early-cut forages can materially reduce the need for concentrates in the dairy ration, as the protein content of the concentrate mixture.

47 Tested Ideas For Hog Profits

Minnesota's 22 Honor Roll swinemen tell how they get big litters to market fast . . .

Condensed from The Farmer

TWENTY - TWO Minnesota swine producers last year farrowed 10.7 pigs per sow, weaned 9.5 of them and raised 9.3—two pigs per sow more than their neighbors could average. They put 4,018 hogs on the market at 215 pounds in 179 days. Daily gain was 1.2 pounds — a good half-pound per day above state average.

Their secret? "There's no secret, so far as I can tell," answered one producer whose pigs made 235 pounds in 166 days—a 1.4-pound average daily gain.

He's right. No secrets, but a lot of smart management.

Follow these practices: 19 use heat lamps; 14 use guard rails in farrowing pens; 20 feed antibiotics; 21 treat for mange. Ten raise all or part of their hogs on concrete. Thirteen vaccinate for erysipelas. Six use farrowing crates. All 22 creep feed. One weans pigs at four weeks, four at five weeks, five at six weeks, seven at seven weeks and six at eight weeks.

All but two vaccinate for hog cholera, but only two use live virus. Seventeen prefer modified virus.

Four of the 22 have tried the new iron injections for anemia, and all four liked them. "We had excellent results, with a lot less work," answered one. "I've never had such big, healthy pigs from gilts before," answered another.

On specific questions, the Honor Roll members gave more detailed answers to management questions.

Most Important Practice

To the question *"What is the most important item in producing big litters?,"* most common answers were:

"Good healthy sows and a rugged boar are essential. Keep only gilts from large litters; pick the largest and oldest," says Carl Block, Windom.

Reprinted by permission from The Farmer, St. Paul, Minnesota

"Flush sows before breeding. Give them plenty of exercise; try not to have them fat," Arthur Bohnsack, New Prague.

"Ear notch all gilts from large and fast-growing litters. At 4½ months, pick the best gilts from this group and put them on pasture where they will get plenty of exercise," Martin Dinse, Owatonna.

Research studies indicate that drying high-moisture corn at temperatures over 160 degrees lowers its feeding value.

"Breed on the second or third day of heat," Floyd Floto and Son, Canby.

"Pick sows with 14 nipples. Feed a bulky ration—I use one-third alfalfa meal in feed which is self-fed," Leslie Foote, Brewster.

"Feed a 10% to 12% protein ration during gestation," Duane Frick, Pipestone.

"Have sows gaining at breeding time," Harvey Holst, Brownsdale.

"Sows and gilts should have good length and depth with at least 12 nipples," Elton Sogaard, Clements.

"Gilts *must* be free from flu. Flush them five to seven days before breeding, and continue flushing through breeding," Vernon Voss, Lakefield.

How to Save Pigs

To the question *"What is the most important item in saving pigs?,"* main answers were:

"I keep only gilts and sows with 16 nipples. A sow can have 16 pigs, but if she has only 12 dinner plates, you lose four pigs right there," Vernon Voss, Lakefield.

"Be with sows at farrowing," John Selland, Madelia.

"Farrowing stalls," Joseph Wertish, Bird Island—an answer which several gave.

"Heat, plus watching sows at farrowing," Carl Tordsen, Round Lake.

"Heat lamps," Harvey Raddatz, Redwood Falls.

Several are using heat lamps in creeps, plus one directly behind sows during farrowing to get pigs dry quickly and keep them warm from the start.

"Keep pigs dry and warm," says Linden King, Racine.

"Guard rails," Henry Kriesel, Owatonna. "My biggest loss was from sows laying on pigs," adds Carl Block of Windom. "Now I use guard rails and my loss is small."

"Care during the first hour is essential," Elmer Hohenstein, Madelia.

"Use a litter that sows can't pile over pigs, then lie on them," H. G. Hansen and Son, Garden City.

"Have sows penned two days before farrowing with good dry bedding in the pen so they won't be restless," Norris Griffith, Owatonna.

"Get sows into stalls prior to farrowing so they can become adjusted to them. Have heat lamps on ahead of time so bedding and floor are warm. Clip black teeth of pigs, use an antibiotic for the first four days, plus plenty of heat lamps," Lee Fullerton, Faribault.

Anemia, a problem with little pigs, was controlled by either iron, sod or both. To the question *"How do you prevent anemia?,"* Arthur Bohnsack's answer of "fresh sod" was common of many.

"Give each pig a treatment of iron solution on the third and tenth days," answered Martin Dinse, Owatonna.

"We had excellent results and a lot less work from one of the new injectible anemia preventives," Floyd Floto and Son, Canby.

"Dirt and iron in a flat pan. Pigs will root in dirt before they will drink," Lee Fullerton, Faribault.

"Give each pig a dose of iron; put iron on sow's nipples," Leo Gostomczik, Medford.

"Mix iron and water and molasses and paint on sow's nipples," Norris Griffith, Owatonna.

"Sprinkle fresh sod with trace minerals every two days," C. G. Pfantz and Son, Pipestone.

Nobody is so narrow minded as people who disagree with YOU.

To Keep Pigs Cool

To keep hogs cool in the summer, many are using sprinklers, often converting perforated lawn hose sprinklers, or sometimes weed sprayer nozzles. *"How to keep hogs cool in summer?,"* was answered "sawdust and a lawn sprinkler to keep sawdust wet" by Lee Fullerton.

"Water on cement floor," said Leo Gostomczik.

"Concrete hog wallow and concrete feeding floor that is partly shaded," Norris Griffith.

"Sprinkler and ample shade," John Selland, Madelia, and Elton Sogaard.

"Posts set in the ground with 2x6's joining them, then corn cribbing and hay on top to make shade," Vernon Voss. "Make enough so *all* pigs can get under them; have enough waterers so there is one for every 50 hogs."

Getting pigs to market in a hurry is, according to the Honor Roll swinemen, a three-way combination of good breeding, good feeding and good management.

C. G. and R. C. Pfantz—top producers this year from a weight forage standpoint — feed a

ground, mixed ration to their fattening hogs. All feed is in the one mixture. "Our pigs get exactly what they should get and in the right proportions, when it is all ground together," this father and son team points out. The mixture includes an antibiotic pre-mix, soybean meal and meat scrap to add protein, ground corn and sometimes ground oats. The corn is artificially dried, and "drying it doesn't take out any of its nutritive value," says the senior Pfantz.

People are rich in relation to what they can do without.

Protein, 18% Down to 11%

Pigs start on an 18% protein ration, which is gradually dropped to not lower than 11% protein for the fattening hogs.

"We try to get plenty of water into our hogs," points out the Pfantz's. Ground feed is fed in troughs on top of water, which comes in from automatic waterers. Water increases consumption and helps put on weight. Wet mash is before the hogs all the time, with additional, dry feed in self-feeders in case the troughs do become empty.

Fattening hogs aren't permitted to range much. They are allowed to range a couple of hours per day on clean pasture until they reach 100 to 125 pounds, "to stretch them out a little so they won't be too chubby." From 125 pounds on, though, the hogs stay right on concrete, close to feed and water.

That kind of handling pays off. The Pfantz's had 228-pound hogs on the market—most of them as No. 1's—in 150 days. That's a 1.5-pounds-per-day average gain from farrowing to market. A later bunch, not a part of the Honor Roll report, beat even that record.

Leslie Foote, whose pigs gained almost as fast as the Pfantz's—1.4 pounds per day—self-feeds on pasture. He likes to start pigs on a high-protein pre-starter, switch them to an 18% protein ration mixed to his specifications, while they are still with the sow, then slowly reduce this to about 14% protein for fattening.

Mr. Foote combines good hog health with his feeding program. Pigs are castrated while still with sows—when the youngest are ten days old. They are wormed three times—when weaned, at 90-100 pounds and at 150 pounds. "I got worms out of them every time," says he, using a liquid in their drinking water to do the job. Pigs get two treatments for mange when ten weeks old, the second spraying, with BHC, coming ten days after the first.

Vernon Voss, who likes to farrow on pasture, times his health management practices carefully to keep pigs growing, yet well pro-

tected. He weans at three and one-half to four weeks, castrates at six weeks, worms at eight weeks. Then comes vaccination for erysipelas and for cholera at two-week intervals. Pigs are sprayed for mange two weeks later, or in summer months, mange treatment and cholera vaccination may be at the same time to save one handling. When that is done, pigs are sprayed with a weed sprayer, from a hose connected to the pump after one of the sprayer boom arms has been uncoupled.

Sows Separately Housed

Sows farrowing on pasture have their own, individual houses, well scattered over second-year alfalfa pasture. Each sow knows her own house, likes the privacy and does a good job of protecting pigs. The houses have low ceilings and walls that slope out, which makes it impossible for a sow to lie down with her back wedged against the wall. That space between sow and wall prevents pigs being trapped and crushed.

John Selland saves pigs with farrowing crates. "I've used crates four years and have lost only three pigs," says this young farmer, who will this year farrow 60 sows. The only time I am apt to lose pigs is after sows are taken out of the crates."

Stresses Guards on Lamps

He's a believer in metal hovers over heat lamps, too. He uses a commercial hover with a metal hoop below, suspended by baling wire. If a lamp should fall, the hoop will tip it over, onto its side, thus reducing the fire danger. "It's nearly suicide not to have guards over heat lamps," says Mr. Selland.

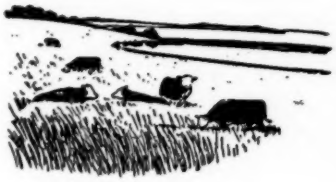
Bred gilts follow cattle, getting stilbestrol in Mr. Selland's lots. He's never had trouble with the gilts, although they follow cattle, getting ten milligrams of stilbestrol daily. Gilts stay in cattle lots until three weeks before they are to farrow.

Boar Gets Special Attention

The other half of the pig-farrowing team — the boar — gets special attention from these top farmers. Elton Sogaard, young Redwood County farmer who topped this year's Honor Roll in numbers of pigs farrowed, weaned and raised per sow, says "I want big boars with 12 to 14 teats, and out of a litter of nine or ten. If I pick a good looking pig with a good record behind him, I won't go far wrong."

Boars are on the Sogaard farm a month before they are to be put to work. That gets them accustomed to surroundings and adjusted to the change in feed. "I'm on a tight schedule," says this young farmer, who farrows five times a year. "When it's time for sows to be bred, I want the job done right then."

The Beef Cattle Cycle and Future Prospects



What to look for in the months ahead . . .

Condensed from
Illinois Farmer's Outlook Letter

L. H. Simerl, University of Illinois

CATTLE numbers are still in the declining phase of their cycle. Beef production will not keep pace with population growth in the next few years. Cattle prices, however, probably cannot be maintained at recent high levels.

Cattle numbers on January 1 were estimated at 94.0 million head. This number was 1 per cent less than that of a year earlier and 3 per cent less than the record high of two years before. The 94.0 million cattle on farms at the beginning of this year were the smallest number since 1952.

Numbers of cattle kept for milk — cows, heifers and replacement calves — on January 1 were estimated at 33.6 million head— 2 per cent below the previous year. This decrease accounted for most of the decline in total cattle numbers during the past year.

The number of beef cattle on January 1 was estimated at 60.4 million — about the same as one year before, but 3 per cent less than the record high of two years ago. Compared with the beef herds of two years ago, present herds include 4 per cent fewer cows and 2 per cent fewer heifers, but about the same number of steers and calves.

The average American spends about 10 per cent of his food dollar for milk, and receives 15 per cent of his protein from that source.

The 1957 calf crop is estimated at 41 million head, which is 2 per cent less than that of a year before and 6 per cent less than the record high in 1954. The 1958 calf crop may be even smaller, since the number of cows on January 1 was slightly smaller than one year before.

Reprinted from Illinois Farmer's Outlook Letter, published by The University of Ill., Urbana, Ill.

While our calf crop declined 6 per cent in three years, human population increased 5 per cent. This makes a reduction of 11 per cent in the number of calves in proportion to population. A further decrease in this proportion will occur this year. These trends point to less beef per person in the next few years than we had in 1957 and 1956. It may be a mistake, however, to expect cattle prices to hold at the favorable levels of the past several months.

The cattle market of recent months received unusual support from two sources: (1) Supplies of pork have been shrinking. (2) The marketing of cows and other low-grade slaughter cattle has been unusually small.

The supply of pork declined from about 67 pounds per person in 1955 and 1956 to 62 pounds in 1957. Now farmers have indicated that they intend to increase spring farrowings by 6 per cent, and pork supplies will increase correspondingly beginning in July. Further increases in pork supplies are likely in 1959 and 1960.

Weekly output of beef so far in 1958 has been 7 to 15 per cent less than it was one year before. Outputs of pork, veal, lamb and mutton have been similarly reduced. This decrease reflects an unusual restriction of livestock marketings, since there is no corresponding decline in livestock numbers. As marketings increase to more normal rates during the months ahead, livestock prices will be adjusted accordingly.

Sales Tax Likely to Increase Farm Tax Burden

A sales tax puts a heavier portion of the total tax burden on farmers, according to Philip M. Raup, agricultural economist at the University of Minnesota. The sales tax has recently been considered as a possible method of increasing state tax revenue in Minnesota. It also has been proposed as a way of relieving the burden on the property tax. But in either case, Raup says, a sales tax would shift a larger portion of the tax burden to farmers.

He explains that the income tax falls relatively lightly on the farmer. A sales tax, however, is based on volume purchases. Since farmers are heavy buyers of household goods and farm supplies, both for the farm business and for the home, a sales tax hits them harder than non-farmers. —*University of Minnesota*

What We Know About BLOAT

. . . and what you can do about it. Despite new theories and treatments, more information is needed . . .

Condensed from Hoard's Dairyman

N. L. Jacobson and *R. S. Allen*,
Iowa State College

BLOAT is a condition in cattle and sheep characterized by gaseous distension of the abdomen, particularly the rumen and reticulum (the first two compartments of the stomach). The factors necessary to produce this abnormality are not well understood, and in fatal cases the actual cause of death is unknown.

The production of gas in the rumen or paunch is a normal condition. However, in bloat the animal is unable to remove the excess gas by belching. Thus, there is an accumulation of gas and an increased pressure in that area.

Many theories have been proposed in attempts to explain bloat. Some of them are:

1. Coarse, rough (scabrous) forages are needed in the paunch to stimulate belching. Some rations contain little or no feed of this type.

2. Due to excessive consumption of dense feed the lower end of the esophagus is submerged in rumen contents so that release of gas is difficult.

3. Substances present in the feed and/or produced in the rumen cause formation of a stable foam which interferes with belching.

4. Substances of feed or rumen origin interfere with nerve reflexes associated with belching.

Several Types . . .

Bloat occurs in animals on pasture, among animals fed green chopper forage (soilage), among animals fed dry feeds and /or silage in the feed lot or barn,

Reprinted by permission from Hoard's Dairyman, Fort Atkinson, Wisconsin

and in young animals of nursing age.

The most acute type of bloat usually is that which occurs on pasture and more particularly that which is produced by alfalfa, Ladino clover, and certain other legumes. These same forages also may produce bloat when fed as soilage. However, bloat is less frequent, probably because more of the stemmy portion is eaten than when animals are on pasture.

Grass pasture (such as bluegrass, brome grass, sudan grass, and orchard grass) and birdsfoot trefoil usually do not cause bloat.

The term feed-lot bloat is sometimes used to refer to that produced on a high concentrate-low forage ration. Bloat of this type has been produced experimentally with rations composed primarily of corn, soybean meal, and a limited amount of alfalfa hay and with many similar rations. Feed-lot bloat frequently, but not always, is less acute than pasture bloat.

Many feeds and feed combinations other than those discussed sometimes cause bloat. An example is high quality, fine, leafy alfalfa hay. In the chronic bloater almost any type of feed will cause bloat if the animal eats it.

In many cases of bloat the contents of the rumen become very frothy or foamy and gases which might normally escape are trapped. This froth is particularly characteristic of pasture bloat. However, a somewhat similar froth is characteristic of much of the feed-lot bloat.

University of Illinois tests showed that pigs fed complete rations gained much faster than pigs fed free choice.

Even in frothy bloat there usually is some free gas in the upper part of the rumen. It is important to remember this in treating acute bloat because temporary relief sometimes can be obtained by removing the free gas.

Some cattle may not have a foamy bloat but rather a type which is characterized by free gas. This is typical of many chronic bloaters. In some cases at least, chronic bloating is due to an anatomical abnormality causing physical obstruction or interfering with the belching mechanism in some other manner. In such animals the gas often can be easily removed by stomach tube, but recurrence of bloat is difficult to prevent. Some cases of feed-lot bloat may exhibit a large amount of free gas, but apparently the animal is unable to remove it in a normal manner.

Some animals bloat more than others. However, in the highly

bloat-provocative pasture a large percentage of the animals may be bloated to some extent. The incidence of feed-lot bloat also varies greatly among herds and among animals within a herd.

Management Helps . . .

Even though there is promise of more effective bloat control measures, the pasture management practices listed which have been helpful in the past should not be ignored:

1. Using mixtures of legumes and grasses.

Although pasture mixtures are helpful, they do not provide complete insurance against bloat. Some animals may tend to eat mostly legumes in spite of the mixture. Also, regrowth of the grasses usually is much less than legumes.

2. Withholding animals from pasture during the most likely bloat-producing stage of plant growth.

Early, lush growth is the most likely bloat producer. On the other hand, alfalfa in full bloom has been known to produce bloat.

3. Providing dry feed on pasture.

Dry roughage, particularly rather coarse hay such as sudan, will reduce incidence of bloat if the animals eat a considerable amount of it before going on the pasture (or if the hay is available in racks in the pasture). High-quality legume hay is much less effective in preventing bloat.

In feed-lot bloat, the use of a considerable amount of coarse forage also will help, but this practice may seriously interfere with the feeding program.

Oils Can be Effective . . .

Recent work in New Zealand and in the United States shows that certain oils are effective in reducing bloat, presumably by reducing the amount of foam in the rumen. The work in New Zealand indicates that spraying a small amount of vegetable oil (particularly peanut oil) on the pasture at the rate of about 3 ounces per animal per day reduces or eliminates bloat.

The oil must be sprayed on the forage shortly before grazing. Except under ideal weather conditions the animals must be placed on a new freshly sprayed plot each day. Under this system "back grazing" is not recommended and may be dangerous if there is a fair amount of unsprayed regrowth.

Work at Iowa State College during the past two years has shown that sprinkling crude soybean oil on green chopped forage at the rate of ¼ pound per 1,000 pounds animal per day, effectively controls bloat. Several other animal and vegetable oils also seem to be effective.

In other studies various oils have been added to the grain fed to cattle just prior to being put on pasture. However, it was found that the effect of the oil did not last for more than about 4 hours except when high levels of oil were fed.

Weight gains of animals at Iowa State College fed ½ pound of soybean oil or lard oil daily were considerably greater (½ to ¾ pound per animal per day) than those of animals receiving no oil. Perhaps this was due in part to the extra energy supplied by the oil. But since they bloated less, they probably consumed more pasture forage.

The use of oil or fat at the ¼ pound per day level should have little effect on milk production or milk quality. Continuous feeding at high levels may affect milk flavor, depending on the oil or fat involved. A recent report from New Zealand states that milk production was not changed significantly by spraying pasture with about 0.7 pound peanut oil per animal per day.

Oils, particularly water dispersible types, added to drinking water will reduce pasture bloat. However, the amount needed is high since consumption of water is quite erratic due to variations in moisture content of the forage temperature, and other sources of water such as dew and rain.

The effects of oils and related substances on feed-lot bloat are less clear. Limited observations indicate that the oils may not be so effective as for pasture bloat.

Potato production in the United States has been increased one-third by control of insects that damage or transmit diseases to potato plants.

Antibiotics May Help . . .

A number of antibiotics have been used with varying success in bloat control. Penicillin, which has received the most attention, often reduces bloat when first added to the ration. However, the effect appears to be transient. That is, the bloat-reducing effect seems to diminish or disappear after the antibiotic has been fed for a time. In some tests this period has been about 10 days.

Therefore, penicillin may have its greatest usefulness in short-term feeding. Also the penicillin must be consumed at a fairly uniform rate if it is to be of any value. Furthermore, exposure to saliva causes deterioration of penicillin. This is of importance where consumption frequently is highly variable and exposure to moisture and saliva is difficult if not impossible to prevent. The common levels of feeding (75 to

100 milligrams per animal per day) usually do not cause animals to go off-feed although higher levels may.

Limited observations indicate that antibiotic feeding is not very effective against feed-lot bloat.

Other Products Promising . . .

Detergents have been used to some extent to control bloat and under some circumstances may be quite effective. However, the large amounts required and the unpalatability of most of these compounds limit their use.

A number of other anti-foaming agents such as methyl silicones and various products derived from fats and oils have been used on occasion as preventive agents in both pasture and feed-lot bloat. Problems of feeding and cost often are limiting factors in their use.

Recently, it has been reported that feeding linseed meal reduced bloat, presumably because of its mucin content. Undoubtedly, many of these materials warrant further investigation.

At one time or another, almost every weather condition imaginable has been reported to increase bloat. Perhaps some of them do have an effect. Hot, dry weather results in a less lush forage and also reduces appetite.

Rain or dew on the pasture forage may in some cases increase bloat, but the presence of such moisture on the plant is of minor importance. Severe bloat occurs frequently in the afternoon when there is no dew or rain on the forage. In many cases, the severity of bloat in the afternoon has been observed to be greater than that in the morning.

Adequate soil moisture is essential for rapid growth and lush forage. In this respect rainfall is related to bloat. Frequently, the incidence of bloat increases substantially from 1 to 10 days after a fairly heavy rain.

Although bloat may occur more often at certain times of the year in a particular area, the combination of rainfall, temperature, and other conditions determines whether the lush forage most likely to cause bloat will be produced.

Plant Components Studied . . .

Several components of legumes that have been, and are being, investigated include saponins, alkaloids, sugars, non-protein nitrogen compounds, organic acids, proteins, and various minerals. Recent work at Iowa State College shows that there is no clear-cut relationship between sugar, non-protein nitrogen, organic acid, potassium, phosphorus, or total ash content in legumes and the bloat-producing ability of the plant.

It has been suggested that a low phosphorus level in legumes increases the likelihood of bloat.

However, severe bloat has been caused by alfalfa with a high phosphorus content as well as by alfalfa low in phosphorus.

Certain legume proteins are being studied because of reports which suggest a possible involvement of these proteins in stable foam or froth formation. The saponin and alkaloid relationships, if any, have not been clarified. It seems probable that several plant components are involved in the production of a stable foam. However, specific relationships of the various plant components to bloat still have not been demonstrated.

Acute bloat must be treated promptly if death is to be avoided. In the late stage of severe bloat, a few seconds delay in treatment may make the difference between life and death.

If the bloat is not too severe and if time permits, the first step logically is to remove the animal from the pasture or other feed causing bloat. In moderate cases the condition sometimes can be relieved by moving the animal about slowly, by getting the animal in a position where the front legs are higher than the rear, and by placing a "bit" in the animal's mouth. A veterinarian should be summoned, but time limitations may make the prompt use of other treatments essential.

When Using Stomach Tube . . .

In more severe cases or when the animal does not respond to the above treatments, a stomach tube should be used in an attempt to provide at least temporary relief. A short length (7 to 8 feet) of garden hose can be used, but a stomach tube with a larger opening is preferable.

The price spread between farmers and consumers is increasing. Farmers received only 40 cents of every retail dollar consumers spent for food last year.

The curvature of the stomach tube should be upward when it it passed through the mouth and esophagus and into the rumen. This minimizes the possibility of passing it into the trachea (wind pipe) and points the lower end upward so it will go to the top of the rumen, thus permitting the removal of any free gas present.

Oils or other defoaming agents can be administered through the tube. About 2/3 cup of animal or vegetable oil (preferably in water-dispersible form) frequently will break the foam in the rumen and permit removal of large amounts of gas through the stomach tube or by belching. Care must be taken to keep the stomach tube open since the flow of gas is likely to be stopped by semi-solid rumen contents.

Animal or vegetable oils are preferable to turpentine and kerosene since the latter have undesirable effects on rumen function and may cause the animal to go off-feed for a few days.

Other Methods of Treatment . .

One alternative method to the use of the stomach tube is the administration of the defoamer by drench. This requires considerable care, however, because of the danger of introduction of the material into the trachea and lungs.

Another alternative for administration of a defoaming agent is the injection of the defoamer directly into the rumen. This can be done with a large hypodermic syringe fitted with a long needle. Care must be taken to be sure the opening of the needle is within the rumen before the agent is expelled, if complications are to be avoided.

When none of the above treatments is effective it may be necessary to resort to a trocar-cannula. Even this is not always effective since the cannula can easily be plugged by foamy ingesta. Sometimes this can be corrected by administration of a defoamer with a syringe through the cannula. If not, a knife should be used as a last resort to open a large hole into the rumen and permit passage of a part of the foamy mass.

It is obvious that much more information is needed before bloat can be controlled effectively. However, a great deal of research is being done on this problem and there is real promise of a much better understanding within the next few years.

The Virtues of Oxen (1907)

Oxen as draft animals are becoming scarce. Two generations ago ox teams were common everywhere; now a yoke of oxen in the streets of cities or populous towns will attract almost as much attention as a pair of elephants or camels. The patient ox is too slow for this hurrying age and is being supplanted by the horse. But on many of our rocky New England farms the slow but sure ox is not to be despised. He has been an important factor in the past in reclaiming these farms from the wilderness and bringing them into their present state of cultivation, and he is still very useful in operations where speed is not a consideration., For clearing fields of rocks or breaking up and plowing rocky land, he cannot be equaled.

—The Old Farmer's Almanac Sampler in 1907

The Dairy Revolution That Started in 1940

A study of New York Cost Account records shows — in facts and figures — what has happened to dairymen . . .

Condensed from Farm Economics

C. D. Kearl

DURING the last forty years, dairy farmers on New York Cost Account Farms have increased their labor efficiency until today's farmer is producing two and one-half times as much milk per hour of labor as did yesterday's dairyman.

New York Cost Account farmers now produce about 110 lbs. of milk per hour of labor. A generation ago they produced about 45 pounds. The increase in amount of milk per hour was at a rate of less than a pound a year for the 1915-1940 period. Since then it has been increasing at a rate of about three pounds per year.

Higher Production and Less Labor Per Cow

This increase in labor efficiency of milk production has been the result of increased production and reduced man labor per cow.

Production per cow has climbed steadily from a level of about 6,000 pounds per year to a level of slightly more than 10,000 pounds. This has been a gradual process since the first years of Cost Account records. Production rates have tended to increase more in the years following 1940 than in the previous two and one-half decades.

The hours of labor per cow declined gradually during the years previous to 1940 but has shown a marked decline since then. In recent years farmers have reduced labor time at a rate of about three hours per cow per year.

Increased Grain Feeding

Over the 43 year span of New York Cost Accounts, costs and prices have paralleled each other in a general way except that there has been a tendency for costs to lag behind prices in both increas-

Reprinted from Farm Economics, published by Cornell University, Ithaca, New York

ing and decreasing. A strong upward swing of prices and costs commenced in 1939. This movement in addition to other economic changes has had a profound effect on grain feeding. The amount of grain fed per cow has increased about two fold. From a level of about 1,900 pounds per cow early in Cost Account history, the rate of grain feeding has increased to about 3,600 pounds in recent years. This increase in grain feeding has been at a slightly faster rate than the increase in milk production. This means, of course, that the amount of milk produced per pound of grain has declined with heavier grain feeding.

There are now more tractors—over 4 million—than horses on American farms. During World War I, the average farm worker had an average of 5 horsepower at his command. Today, he has nearly 50.

At today's levels of milk production, about 35 pounds of grain are required to produce 100 pounds of milk. This compares with about 30 pounds forty years ago. The decrease in feed efficiency may actually be greater than this, for today's cows are fed 95 pounds of hay equivalent per hundred weight of milk compared with 92 pounds forty years ago, and there are indications that roughages and pastures are of better quality now than in years past.

The feeding of more grain has been due to the fact that grain prices have not increased relative to milk prices, while other costs have gone up faster. Thus, even with some loss of feed efficiency it was desirable to feed heavier, to spread fixed costs and achieve greater economy in the use of other production factors.

Over the years there has been a slight tendency for grain to become cheaper relative to milk. This trend was arrested or reversed during the war periods when humans tended to compete with animals for grain in their diet. A comparison of the pounds of grain fed per cow and the amount of milk required to buy a ton of grain would indicate that farmers are aware that grain is only one element of cost and take other factors into consideration in deciding the amount of grain to be fed. If other costs were increasing, farmers might still find that it paid to feed more grain in order to increase production and reduce overhead costs per hundredweight.

Higher Labor Costs

Farmers have been encouraged to obtain greater labor efficiency because of rapidly increasing labor costs. Farm labor costs increased during World War I, de-

clined during the depression, and have jumped since 1940. Today's farm labor is four times as costly per hour as it was just sixteen years ago. Even though prices of milk have been relatively favorable, they have increased only about two and one-half times in the same period. This has meant that farmers have had to restrict the use of relatively expensive items like labor and substitute less expensive items.

Other ways that farmers have found to spread overhead and reduce costs are to increase the number of cows, and at the same time, as previously noted, reduce the time required to care for a cow. The Cost Accounting farms, especially in the last six or seven years, have rapidly expanded their herds. This trend has been persistant with no indication of when an abatement may come.

Since 1940, New York Cost Account farmers have adjusted to rapidly increasing costs. Faced with rapid increases in wages, they have added to their herds and reduced the amount of labor per cow. They have fed more grain (a low cost item relative to milk and most other prices) and obtained higher rates of production. They have spread overhead costs over a larger volume of production. Other farmers can and are doing some of these things. Indeed they must, if they are to meet their competition well enough to make a good living.

Antibiotics Little Help in Jumping Milk Yield

The use of aureomycin for feeding milk cows was recently approved by the United States Food and Drug Administration.

This may result in new advertising appeals being made on commercially-prepared dairy cow rations that have antibiotics included.

According to carefully controlled experiments at several state agricultural experiment stations, there was no benefit in adding aureomycin to dairy rations insofar as milk production was concerned. Additional research has indicated there is no benefit in getting hard to settle cows in calf by feeding antibiotics.

There may be some benefit in preventing scours, foot rot, and respiratory infections, including shipping fever according to F. Meinershagera, University of Missouri. However, it might be questioned if feeding antibiotics for disease prevention is justified.

It won't replace good care and management. The use of antibiotics for prompt treatment of infections may result in more effective control of disease than if they are fed as preventive measures.

—Missouri Farm News

How to Fight the Spotted Alfalfa Aphid

Looks like they are here to stay. Sprays plus predators are the best controls . . .

Condensed from Better Farming

Albert DiDario

EARLY IN 1954 the spotted alfalfa aphid poked its ugly nose into farming for the first time. Since then it has spread destruction like wildfire from New Mexico across two-thirds of the continent. Now, in spite of tremendous progress toward control, it appears this new hay-crop pest is here to stay. We'll have to live with it, using control measures to keep down the injury.

Appearance and Habits

The aphid is pale yellow in color, with rows of black spots across the back—about 1/16 to 1/8 inch in over-all length. Very early in life they produce 50 to 100 nymphs per female—no eggs. This accounts for the fact that we find them as either nymphs or winged or wingless females. The reproduction process is completed in about two weeks, making possible the rapid spread of the aphids.

The pea aphid also infests alfalfa and is often confused with the spotted alfalfa aphid. Actually, it's quite simple to distinguish between them. The pea aphid is twice as large, green in color and lacks the rows of black spots. And while the spotted alfalfa aphid starts its destruction at the bottom of the plant and works up, the pea aphid starts at the plant terminals and works downward.

Spotted aphids thrive in high temperatures, shading themselves by working on the lower parts of the plant. Extreme cold temperatures tend to keep down their numbers. Likewise, their population seems to be smaller after heavy rains. That's one reason

Reprinted by permission from Better Farming, published by The Oliver Corporation, 1119 West Sample Street, South Bend 21, Indiana

why spraying is not recommended immediately after a rain.

Plant Damages

Wilting, reduced yields, impaired flowering and seed setting, and even complete loss of new seedings are common results of serious aphid infestations. The tiny pests do their damage by extracting the plant sap through a long, hollow tube-like mouth, then leave an excreted honeydew on the plant that becomes a medium for harmful bacteria and fungi.

Warm weather means lots of lush clover. Keep salt boxes full and have a rack of hay or shucks in the pasture for cattle to help prevent bloating.

Actually, the damage they do takes many widely different forms. The extent of the damage naturally depends on the number of aphids present. But reduced alfalfa production is the end result in almost every case. In some cases it shows up as a slow regrowth after cutting. Other times it's a gradually dwindling stand.

Another type of damage is the result of honeydew accumulation that slows up machinery in mowing and baling the crop. Cutter bars of mowers and forage harvesters are especially affected. The gummy excretion of the aphids causes clogging of machines and slow drying.

Plant Resistance

The spotted alfalfa aphid seems to confine its destructive work to a few members of the legume family. Besides alfalfa, the aphid is generally found to attack bur clover, black medic, red and white clover, sweet clover, sour clover, button clover, vetches, bird's-foot trefoil and Sesbania.

Resistance or tolerance to attacks by the aphids has been shown by some strains or varieties of alfalfa. The variety Lahonton and several experimental crosses have shown good resistance. So has Buffalo. But unfortunately, Lahonton is not a high yielding variety and is poorly adapted to the Southwest.

The U.S.D.A. and many state colleges are carrying out breeding programs in search of suitable varieties with both aphid resistance and good-growth characteristics.

Control Measures

Thorough spraying has proved to be the best method of aphid control. But even with good practices, many fields are often repopulated. This is because there is *no such thing as a complete kill.* And the rate of reproduction is so great that a field can be seriously reinfested from a few females in a matter of several

weeks. Also, reinfestation occurs from flights originating in neighboring untreated fields.

Spraying with parathion at the rate of four to six ounces of actual material or one pint of 25% emulsifiable concentrate in six to ten gallons of water per acre has been successful. Lower rates of application have been used but the results are delayed three to four days. In some cases, up to 20 gallons of water have been used with good results.

Stop guessing and start testing for the amount of fertilizer needed to grow crops.

A few researchers have reported a growing resistance of aphids to parathion. But as yet, no report of resistance has been heard from the use of the methyl parathion variety of the chemical. This is not to say that such a resistance is not possible or even probable.

Malathion at the rate of one to 1½ pints of 55% emulsified concentrate in six to 20 gallons of water per acre has been very effective — even in the areas where parathion tolerance was observed.

But these insecticides not only destroy the aphids. They also knock out the natural predators that help to control the aphids. Some scientists feel so strongly about the toxic effect of these chemicals on the beneficial insects that they seriously question the use of such insecticides.

Reports indicate that three new chemicals have been found which will act on aphids but leave the beneficial insects unharmed. They are Systox, applied at the rate of two ounces per acre on alfalfa raised for seed only; Trithion, at the rate of six to eight ounces per acre; Phosdrin, at the rate of 1/3 ounce per acre. Systox still requires release from the Food and Drug Administration before using on alfalfa to be fed to animals.

Harmful residue on feed crops following insecticide applications is always a problem, but its seriousness is minor when a few simple instructions are followed. Parathion and methyl parathion should not be used later than 15 days before cutting. Malathion should be applied no later than seven days prior to cutting. Systox requires 21 days; TEPP, three days, and Phosdrin, five days.

Spraying

Best results have been obtained with chemicals applied with a sprayer capable of producing pressures up to 200 pounds per square inch—the power to force spray material into all plant parts. At the same time, the material is thoroughly atomized, engulfing the entire plant.

Too great a pressure usually results in applying too much material, unless nozzles with small openings are used. But with small nozzle openings, there is a problem of clogging. Usually line-strainers will prevent clogging.

Economy considerations have demanded a new sprayer unit that produces 200-pound pressures, carries a relatively large supply of material and is low-cost. It should have a pump capable of delivering at least five gallons per minute for a 20-foot boom with down-drop pipes.

In young alfalfa the brush-type boom with nozzles mounted directly to the boom pipe has given sufficient penetration. However, the down-drop type of boom has proved much more satisfactory in lush hay. The down-drops are flexible and carry two nozzles each that can be adjusted horizontally and lowered to 4 to 6 inches above the ground. Thus, the spray material is delivered in a sideways direction from down under much of the foliage.

Research to date has shown that best control is obtained when the spray pattern coming from the nozzles is in the shape of a cone — either solid or hollow. Flat, fan-shaped patterns used for weed spraying are not satisfactory. The pattern is created by the nozzle tips used, and can be changed with very little expense.

Biological Control

The spotted alfalfa aphid seems to be immune to the attacks of some predators and parasites affecting other aphids. Yet researchers continue their efforts to find a truly effective predator. Entomologists have always recognized that the greatest single force preventing insects from overwhelming the world is the fact that they are fed upon by other insects.

Seed selection is one of the important steps in successful crop production.

Thus far, the only natural enemies of the spotted aphid are the lady beetles, big-eyed bugs, lace-wings, minute pirate bugs, damsel bugs and Syrphid flies. However, scientists have introduced three Mediterranean insect parasites that have proved beneficial in some localities.

In spite of both natural enemies and man-made chemical controls, the spotted alfalfa aphids have spread like fury across most of the United States and have edged into southern Ontario in just four years. And all evidence points to the fact that more damage, costing millions of dollars, will be done before effective control is realized. They are pests we're going to be living with for a long time—maybe forever.

Is Irrigation for You?

Artificial rain may no longer be something for the other fellow. Here's how to determine if irrigation fits your farm . . .

Condensed from Successful Farming

Vern Schneider

EVERY farmer is a *potential* irrigation farmer. However, this does not mean you should—or could—*irrigate* your farm. Many factors must be considered before you lay your money on the line for an irrigation system.

It's not our purpose to say that irrigation fits all farm operations. It doesn't. Consider it as a production tool *only* if it fits your farm. Here's why:

First, it's going to cost you some money. Irrigation systems will range from $3,000 to $4,000 on up, depending on the acres irrigated, source of water, and type of system. Cost will vary from $50 to $120 per acre on initial investment, depending on the same factors. Cost of operating will vary from $2 to $4 per acre-inch of water applied. This includes fuel, labor, interest, and upkeep. Get some professional help. You wouldn't think of spending $8,000 to $10,000 on a new house without a set of blueprints. Neither should you invest this much on an irrigation system without first getting a "set of blueprints" on your farm. Then get professional help to design an irrigation system to fit your farm.

Second, irrigation isn't automatically going to make you successful overnight. As a matter of fact, it takes more than just water to make irrigation successful. More technical know-how is needed than in any other method of farming. Other factors of production—fertility level, plant population, rate of planting, kind and amount of fertilizer, weed control, insect control, and the right varieties—must be kept in balance in order to take full advantage of irrigation as a production tool.

Here in a nutshell are the factors you must consider in determining whether irrigation fits *your* farm:

● **Do you have a source of water?**

If you don't, you may as well forget about irrigation. However,

Reprinted by permission from Successful Farming, Des Moines, Iowa

potential water sources haven't been fully explored. We'll have more to say on this.

● **What kind of irrigation system is best for your farm?**

Irrigation systems can be classified in two categories—gravity (flood) and sprinkler. Topography, amount of land to be irrigated, labor supply, type of soil, depth of soil, and kind of crops to be irrigated are the major factors which determine the right system. Again, seek professional help. Shop around when buying a system. Then make your decision.

Plow-planting corn not only saves money on seed bed preparation costs but yields are a little better, report Michigan State University soils specialists. In 1957 tests, plow-planted corn yielded an average of 11 bushels more per acre over conventional methods.

An irrigated farm is an engineered farm. A well-planned irrigation system, whether flood or sprinkler, should be designed to take the water off the land as well as put it on.

● **How will you market the production from irrigated acres?**

You don't have much of a problem if you raise sweet corn or seed corn. However, these are limited crops. Most of the production will be marketed through livestock. Feeding programs must be designed to make *maximum utilization* of crop production.

Most roughages can be marketed *only* through livestock. Some of the best returns from irrigation come from the production of pasture, hay, and silage. Green chopping, rotational grazing, and feeding out of storage are a few of the improved practices you can put to use.

Grain crops, too, must be utilized in the most efficient manner. Proper harvest and storage are necessary. Remember, it takes a 60- to 70-bushel corn crop or even more at 1957 prices, to cover all the costs, including labor. Shoot for a minimum of 100 bushels per acre.

Big-dam Reservoir

You're in luck if you are in an area where water can be obtained from a big-dam reservoir. Many of these reservoirs are being developed in the High Plains area, reaching from the Dakotas to Oklahoma. You buy the water in a setup such as this. Cost usually runs $3.50 per acre-foot of water.

Large-size Farm Reservoirs

This is one of the greatest undeveloped sources of water in the humid belt. After all, the farmer gets first crack at the water that falls on his farm. However,

you'll need the drainage and topography to make this type of storage possible.

A lake should hold 1½ acre-feet of water for each acre to be irrigated. This will allow 1/3 of the water to be lost by seepage and evaporation, leaving 1 acre-foot for each acre of land to be irrigated.

About 6 acres drainage area will be required for each acre-foot of storage capacity.

Rivers and Small Streams

Here again, this source of water depends on your location. Be sure to check your state's water laws before attempting to use this source of water. Water laws vary from state to state, so we will not attempt to define each state's laws in this article. Just don't get caught buying an irrigation system before you have established your right to draw water from this source.

Drainage Ditches

This is a limited source, but a good one if it goes through or joins your farm. Again, make sure of your right to draw from a drainage ditch. Dredging out a low, wet spot often will yield enough water to irrigate. Don't overlook such sources as a gravel pit.

Regardless of where you get your water, make sure it's not "bad water." There's nothing more discouraging than to find out that your water supply cannot be used on crops. Get a water analysis if the quality of water is uncertain.

Fenuron, a new chemical brush killer, is made up similar to fertilizer pellets. It can be used early in the growing season to control post and blackjack oaks and winged elm growing on sandy soils, says G. O. Hoffman, Texas range specialist. A visit with the local county agent will provide complete details on how to use the new material.

Deep and Shallow Wells

In certain areas, ground water is the best source. Again, make sure of your state's laws in regard to drilling wells for irrigation purposes. How deep you need to go depends on the kind of water-bearing formations beneath your farm. You may find water at 15 or 20 feet and you may have to go 1,000 feet. You're fortunate if you find water at 15 to 20 feet. Deep wells can run into a lot of money in developing and equipping. The cost of pumping extremely deep wells may be excessive unless you can produce and have a market for more intensive crops.

It's very important to get a well driller who knows his business. Such things as depth, size of bore, and capacity depend on conditions on your farm. Don't take your neighbor's conditions as a basis for drilling. Yours may be entirely different. A test well is often necessary to determine where and what kind of well to drill. Many areas are mapped or being mapped. This will give you a general idea of ground water possibilities in your area. But you'll need specific data on your farm. The type and capacity of your irrigation system depends on the depth and capacity of your well.

In summary, here's the best advice we can give: Use professional help in drilling the well and designing the system.

Take a long, hard look before you plunk down $5,000, $10,000, or $15,000 for an irrigation system. Consider the alternative use of this money for other improved production tools.

But if you've reached the point where water is your greatest limiting factor in crop production, irrigation may be your next production tool for reducing your per unit cost of production.

New Take-Down Prefabricated Milking Stalls

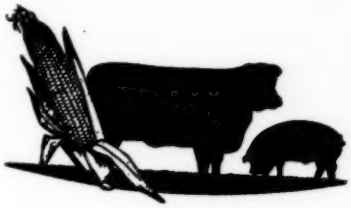
Prefabricated stalls and mangers in dairy barns look like a good way to build new barns at less cost and allow for easier remodeling.

Wisconsin farm engineers have designed pre-fab stanchions and mangers which can be installed more rapidly and cheaply, removed or put back in easily. This would allow a farmer to make such changes as shifting interior arrangement to take advantage of new machinery, switching to loose housing, using the barn for storage or other types of livestock, and providing wider or narrower stalls.

The concrete work with the pre-fab units would be less expensive, they say. Less forming is needed, so there would be savings in form lumber, concrete, and labor. The floor is practically level, except for the gutters. The stall units are set into holes provided for them when the floor was poured. When the stalls are in, the holes are filled with sand and covered with concrete.

The pipes supporting the stanchions also serve as water lines and vacuum lines for milking machines. The manger may be built of metal, plastic, fiberglass, or wood and is attached with hooks to the front of the stall. *—University of Wisconsin*

Tranquilizers . . .
Can They Bring Bigger Livestock Profits?



Researchers believe tranquilizers may be another great contribution to the exciting world of animal nutrition . .

Condensed from The Young Farmer

Bob Christianson

"OUR COWS aren't contented — they're always striving to do better!"

The alert dairyman who coined that slogan captured the fancy of his buying public—and built a thriving business.

Of course, his customers know it's all in fun. They know that contented cows DO produce rich milk in large quantities. You know it too. When cows get excited, production drops.

As long as contentment of cows is a big aid to milk production, why not try injecting a bit of it into our steers, swine, sheep and poultry too? Shouldn't it help us produce more meat and eggs with less feed and lower costs?

"Sure," says researcher Dr. W. H. (Bill) Hale, "we're doing it NOW. And, if all goes well, it probably won't be long before we can advertise beef from contented steers, eggs from contented chickens, or chops from contented porkers!"

Hale, in charge of large animal nutrition research at Charles Pfizer's Experimental Farm near Terre Haute, Indiana, has good reason for his belief. He's one of the pioneers in studying the effects of tranquilizers in animal nutrition. Results he and others in the field have achieved show great promise.

Key to this contented feeling on the part of livestock and poultry is use of tranquilizers—drugs which bring about a calming or sedative effect without inducing sleep.

Although tranquilizers have been with us for many years, their widespread use by humans dates back only a few years. Millions of people in this country

Reprinted by permission from The Young Farmer, published by General Mills, Inc., Mpls. 1, Minn.

use tranquilizing pills to calm their nerves, to set them at ease. The pills bring about relief from stress and strain. Tranquilizers have played a tremendously important role in the treatment of mentally ill persons. And, the drugs help speed up rehabilitation after nervous breakdowns or similar conditions.

Farmers in China preserve eggs by a bacterial action, much the same way as we process milk by turning it into cheese.

The dictionary refers to the word "tranquil" as being "quiet, calm, undisturbed, not agitated."

Apply this to animals and the results can be startling. The drugs have a soothing, calming effect yet don't make the animals lazy or shiftless.

At first it was thought that tranquilizers would play a big role in handling livestock during periods of stress—those periods when animals become nervous or flighty. Shipping fever, for example, is caused by the stress placed on animals during shipment — pushing, shoving, strange surroundings, change in feeding schedule, lack of the feed they're accustomed to, and temperature changes. The animals lose weight, bring in less money.

The theory was tried out with great success. Scientists then felt that many other things could be accomplished with tranquilizers. Among the ideas for using the drugs were:

Calming nervous or cannibalistic sows.

Giving vicious bulls a new outlook on life.

Quieting stallions.

Easing the stresses of calf or pig weaning.

Taking jitters out of household pets.

And the list could go on. Tranquilizers have proved themselves in some of these uses. Others are being tried.

But the most dramatic role played by tranquilizers is expected to be in the field of livestock nutrition. This is the idea which captures the imagination.

"Why not," Hale reasoned, "see if we can strike a happy balance by using enough of a tranquilizer in a feed to cut down unnecessary motion and minimize the effects of stress, yet not enough to make the animal shiftless? The result might be better gains per pound of feed. Wasted energy could be converted into salable meat."

Thus started a series of experiments not only at Pfizer Research Farm but also at land-grant colleges and other industrial research facilities.

In the paragraphs that follow, we'll discuss two types of tranquilizing experiments — *nutritive*

and *sedative*. The nutritive use of tranquilizers involves mixing small amounts in the feed. Object is to get better gains in normal animals by cutting down waste motion and minimizing the effects of mild stresses. The sedative use usually involves an injection of larger doses. In sedation, the object is to quiet a nervous, upset or wild animal.

Best location for band fertilizer at planting time is below and to the side of the seed. High concentrations of nitrogen and phosphorus salts placed too close to the seeds cause most fertilizer damage.

Beef Cattle

Nutrition — Steers in all age brackets at Pfizer Research Farm have been getting 2½ to 5 milligrams of tranquilizer per day the easy way — mixed in with the feed.

Steers getting this daily addition to their feed show about *15 per cent faster gains with about a 10 per cent saving on the feed bill!* These results have been observed in tests with hundreds of steers.

A 1000-pound steer will get about 2½ milligrams of *Tran-Q* (Pfizer's trade name for hydroxzine, a synthetic tranquilizer) per day. As the steer gains the daily tranquilizer intake is upped slightly. This dosage is far below the amount used as a sedative on animals and far below the therapeutic dosage for man.

There has been no evidence of down-grading of beef carcasses at any of the Tran-Q test levels. As a matter of fact, the 2½-milligram level suggests possible improvement in carcass quality and dressing percentage.

Sedation — Tests at University of Nebraska indicate a lot can be done to help calves at weaning time. Usually when weaned, calves spend two or three days bawling. They refuse to eat. Sometimes the situation is complicated even more when calves are shipped right after weaning. Tranquilized calves seem to make adjustments faster and suffer fewer setbacks.

Also at Nebraska, steers shipped to market were injected with tranquilizers. When compared to non-treated animals, the tranquilized steers arrived in better condition and did a better job in the feedlots after arrival.

In some southern states, Brahma cattle must be corraled often. During the pushing and shoving they get excited. Many are bruised. The result? Screw worms lay eggs in the bruises and hides are damaged. Feed efficiency falls off. Tests so far indicate that eserpine (another form of tranquilizer) will cut down these losses. But eserpine

shots can be costly. If a suitable tranquilizer can be mixed with feed, another big problem will be eliminated.

Sheep

Nutritive — Commercial feed lot trials at Iowa State College produced some interesting results when tranquilizers were added to feed. Researchers there came up with a *17 per cent increase in daily gain at a 6.5 saving in feed costs!* In that experiment lambs were fed 1.5 grams per ton of feed. And, there was some evidence of increased carcass quality. (Lambs consumed about 2.75 milligrams of hydroxzine per head daily.)

More recent tests under Hale's guidance show even more spectacular results. Lambs are showing nearly 25 per cent faster gains at about 15 per cent increase in feed efficiency. In one trial, lambs on tranquilizers gained *42 per cent faster* than did the control group!

Here again, the dosage was far below levels which would produce a sedative effect.

Swine

Nutrition — Results to date have not been too encouraging but work is continuing. Tranquilizers seem to hold more promise in the sedation of swine than in weight gains.

Sedation — Tranquilizers may prove quite useful in large breeding operations, especially when the operator allows boars to run together. Tests indicate that tranquilized boars get along without fighting, yet they show no decrease in breeding efficiency. Work on this phase is still going on, with much yet to be learned.

Researchers suggest tranquilizers may have some important uses in the handling of gilts, too. The drugs may cut down nervousness before breeding or during farrowing time. Cannibalistic or mad sows may, under tranquilizers, take better care of their pigs.

One gram of procaine penicillin per pound of salt offered free choice looks promising in controlling bloat.

Poultry

Nutrition — Dr. G. A. Donovan, in charge of Pfizer's poultry nutrition research, said tranquilizers may have some effect in improving egg production and cutting down feed costs in broiler and turkey operations.

"Studies in California," he said, "indicate that tranquilizers increase a hen's tolerance to heat. Result was higher egg production during summer months. Perhaps the same effect might be noted in cold areas."

"Most good laying hens are flighty and excitable. If we can quiet them with an in-feed dose of tranquilizer, the result may be

better egg production. We may eliminate piling-up and suffocation which results when flocks are frightened. With turkeys, it may be possible to eliminate losses caused by the same thing. Tranquilizer also may cut down treading."

A Brown Swiss cow at Lee's Hill Farm in New Jersey has just won a world championship by producing close to a ton of butter in a year. Year's end records showed that the cow had given about 34,800 pounds of milk and 1,564 pounds of butterfat. In more familiar terms, that's 15,700 quarts of milk and about 1,955 pounds of butter in a year.

"We're working on nutritional aspects of tranquilizers in poultry flocks and at the same time we're noting side effects. The final story will be measured in weight gains, general performance, feed efficiency and dressing percentage."

Sedation — Broilers and turkeys suffer a considerable amount of shrinkage enroute to market. It could be that tranquilizers can cut down these losses.

Cornell University, Ithaca, N. Y., made an important contribution to the field in its work with game birds.

Pheasants, perhaps the most cannibalistic of all birds, have a low rate of s u r v i v a l among youngsters. They eat each other, pick each other's feathers and fight like professional wrestlers. Many die before they have a chance to look over the world. Reserpine added to their feed prevented fighting and reduced the incidence of feather picking.

"This work may prove useful in our poultry and turkey research," Dr. Donovan said.

Dairy Cattle

Nutrition — Use of tranquilizers in this field does not look as promising as it does in the production of beef and poultry. Contented cows getting maximum feed for milk production and body maintenance most likely won't show much response to tranquilizers. However, many specialized uses may prove practical. Many of these will involve sedative effects.

Potatoes themselves a r e not fattening—it's what we put on them that pile up the calories.

Sedation — It's possible that the conception rate of heifers and cows may be raised if tranquilizers are used to reduce stresses. Bulls may be tamed without affecting their breeding efficiency.

Nervous, freshening cows can be calmed by tranquilizers. This results in easier handling and better care of calves.

"Some of these things can be done through the injection process," Hale said. "We're trying to learn if the same things will happen when tranquilizers are added to feed."

Summing it up, it now appears that tranquilizers will take their place among the growing list of *production supplements* such as antibotiics and hormones, trace minerals and unidentified growth factors. Much remains to be done before tranquilizers are accepted for widespread use by the feed industry.

Before tranquilizers become available for general use by the feed industry the drugs must be approved by the Food and Drug Administration. FDA is a government agency charged with protecting the nation from quack remedies, harmful drugs and bad effects of food additives.

At present, tranquilizers are available for use by veterinarians. None are available for general herd or flock treatment. After FDA approval (which seems a certainty) tranquilizers most likely will be included in the feed bag.

2,4-D Controls Gophers

New strategy has been adopted in the age-old battle of man against the pocket gopher.

Instead of fighting underground where the gopher is in his element, the scene of action has moved to the surface and it looks like man finally has the upper hand.

Man's big weapon is 2,4-D, as demonstrated in tests conducted jointly by biologists in Colorado. The scientists found that spraying rangeland with 2,4-D gave 87 per cent control of gophers.

Dr. Richard S. Miller, project leader for the Experiment Station, said it is not yet known how the herbicide acts to reduce the number of pocket gophers. Further research may produce the answer, he added.

A butyl-ester formulation of 2,4-D was applied on some 2,000 acres of rangeland. Spraying was done by airplane with diesel oil acting as the herbicide carrier. Rate of application was three pounds of acid per acre. On the sprayed areas, gopher populations decreased by 87 per cent. Analysis also showed more grass and fewer weeds as a result of the spraying. Tests will continue.

—Colorado State University

Should We Give Up Oats?

Oats are a money loser on most farms, even as a nurse crop for new seedings. Here are ways to make more profit . . .

Condensed from
Massey-Ferguson Farm Profit

OATS—a crop much scorned of late because it is a "money-loser" on many farms—is not dying very fast. More oats are seeded today then five years ago. We will have about 47 million acres this year—6 million in Iowa alone.

Since there's no doubt that oats are here to stay, for quite a while at least, how can farmers make this a profitable crop in 1958? Two ways: Grow more bushels per acre. Or, put at least some of your oats crop into silage.

Iowa State agronomists figure it takes 40 bu. per acre of 65c oats to break even. At that rate, Iowa farmers have lost money on oats the past 10 years when their crop averaged about 38 bu.

"It is possible to produce 75 to 90 bu. of oats per acre in Iowa regularly, especially on the better land areas," says Prof. K. J. Frey, agronomist.

Oat yields could be jumped if farmers followed their ag college recommendations on fertilizer: In Wisconsin, they'd increase plant food from 32 lbs. to 160 lbs. and boost their yields from 48 to 75 bu. Michigan farmers could step up plant food use from 70 to 150 lbs. and boost yields from 38 to 62 bu. In Illinois, 40 lbs. more of plant food would step up yields from 37 bu. to 55 bushels.

But won't high oat yields cut your seeding stand?

Poor fertility has hurt seedings worse than heavy oat yields, say agronomists. Fertilizing oats helps get the seeding off to a good start. Of course, taking oats off early for silage gives seeding an ideal start.

Along with fertilization, selection of proper variety is all-important. For example, in Indiana, Clintland, a rust-resistant oat recommended by Purdue

Reprinted by permission from Massey-Harris Farm Profit, 1025 Empire Bldg., Milwaukee 1, Wis.

University was seeded on only 45% of the state's acreage. It averaged 55 bu. per acre. But more than 300,000 acres was planted to Clinton 59 which made about 37½ bu. "Failure to follow recommendations cost farmers a yield increase of 17 bu. per acre," reports Keller Beeson, Purdue agronomist.

Top corn yields depend a lot on the number of plants per acre. Crop specialists say to increase the seeding rate about 10 per cent over the plant population wanted. This margin will take care of seed mortality.

Rust is the biggest danger on the oat horizon. Crown rusts of at least 5 different races, all rare or previously unknown in this country, caused mild to severe losses in oats in 1957. But danger of these rusts spreading is exceptionally grave in 1958, say oat breeders and pathologists.

A striking example is the rapid spread of common races of rust that hit Victoria-type oats. In just one season, they spread from the Southeast to the Rocky Mountains.

Breeding new varieties resistant to rusts is the answer. And although some progress has been made, this is a long and tedious process. And real danger is that of some 30 commercial varieties of oats normally grown, none is resistant to all of these 5 new crown rusts.

While not resistant, some varieties such as Cherokee, Nemaha and Bonham have shown tolerance to old races of rust. Ninhofer is good where adapted. *Be sure and check with your county agent on recommended varieties for your area.* . .

Oats have a black eye because when the figures are added up, oats show a loss on most farm record books. In Illinois, according to the National Plant Food Institute, oats show a loss of about $11.70 per acre; in Missouri, $6 loss; in Iowa, only $2.70 profit per acre.

Oats have plenty of defenders who say bookkeeping is faulty if you charge the whole year to the oat crop. If you use oats merely to get a seeding, then the oats crop is all gravy. J. Ross Fleetwood, Missouri agronomist, says: "Oats can be one of the most profitable crops a Missouri farmer can grow if he is short of hay."

Illinois crops specialist Walter Scott emphasizes that oats can be profitable if you start with a good, disease-resistant, adapted variety, then follow with proper cleaning, treating, early planting and proper harvesting.

Many farmers use oats in their rations and would be lost without it. And oats can be raised cheaper than it can be bought. Paul

Guyer, Nebraska livestock specialist, says oats can be substituted for up to one-third of the corn in fattening rations for cattle in the dry lot or on grass. Oats at 70c a bushel compare favorably to corn at $1.22.

Most promising approach to get oats into the profit column is to put it into silage. In Purdue tests, oat silage produced up to 600 lbs. of beef per acre—100 lbs. more than legume silage. Cattle made gains at a feed cost of only 16.8c a lb. on a daily ration of 34.4 lbs. of oat silage, 3 lbs. of corn and 1 lb. of Purdue Supplement A.

Oat silage was chopped directly from the field and blown into upright silo with no preservative added. It was cut in the late milk to early dough stage. Yield was 7 tons of silage per acre from oats that yielded 60 bu. of grain. Figuring oats at 63c a bu. and cost of ensiling at $3 a ton, grain equivalent value of silage was $8.40 a ton. University of Minnesota tests show oat silage was as good as corn silage in fattening lambs. Oat silage has more protein than corn silage but less energy; less protein than grass-legume silage, but more energy.

A few farmers prefer to make their seeding without benefit of a nurse crop. Band seeding and proper fertilizer placement result in excellent stands.

"But the percentage of successes in establishing forage seedings is, in general, no better *without* oats—so why not grow an oat crop too?" says Prof. K. J. Frey, Iowa State College agronomist. The oats crop can be an extra dividend.

An Indian petitioned a judge of an Arizona court to give him a shorter name. "What is your name now?" asked the judge.

"Chief Screeching T r a i n Whistle," answered the Indian.

"And to what do you wish to shorten it?" asked the judge.

"Toots," the chief replied.

Other main objection to not using a nurse crop is the weed problem. Weeds generally furnish more competition to the seeding than do the oats.

"By farm experience, oats are considered superior to wheat as a companion crop for spring seedings," says Keller Beeson, Purdue University. "A companion crop helps keep weeds under control and is regarded as generally necessary in Indiana. In any case the farmer is getting a cash return and at the same time establishing his spring seeding and controlling weeds."

Will wide-row corn, with seedings in between, eliminate the

need for oats. Some farmers think so. They grow corn in 60-inch to 80-inch rows, then seed their alfalfa or clover in between in the fall.

Corn yields have been good—no decrease in yield in 60-inch rows, and perhaps a 15% decrease in 80-inch rows. Success of seedings have varied from excellent to poor.

Iowa State agronomists feel the corn yields have been more satisfactory than the seedings because weather and climate favor spring forage seeding.

"Not adaptable in the western half of Iowa and highly questionable in eastern Iowa," is the way Prof. Frey puts it. "The number of seeding failures has been much higher in corn than in oats. In addition, farmers do not like the bare strips which were corn rows. Weeds spring up here and cornstalks often contaminate the hay."

Harvested as silage, oats produce 48% more total digestible nutrients per acre than oats for grain, according to University of Minnesota tests. This is the same as getting an increase of 34 bu. of oats, or an increase of 17 bu. of corn per acre.

Illinois tests showed that a 60-bu. oat crop returned $125 per acre when fed as silage to calves. Harvested as grain, it would have grossed $45 per acre, with oats at 75c a bu.

Removing oats 2 to 3 weeks before they would be cut for grain gives the legume seeding a much better chance. Main thing to watch in making oat silage is to cut oats in late milk or early dough stage. If you have a large acreage, start soon enough to get all oats in before the hard dough stage. A high yielding field of oats will make 10 to 12 tons of silage to the acre. Obviously, all of the oats seeded this year can't go into silage. But plan to cut some.

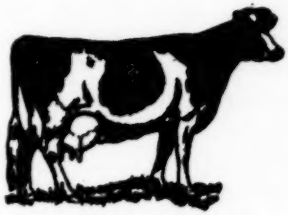
Proved Sires Are Improving Dairy Herds

Milk cows bred from 932 proved sires used by artificial dairy breeding associations in the United States during 1956 produced an average of 11,301 pounds of milk and 477 pounds of butterfat.

This compares with an average production by the dams of these same cows of 10,600 pounds of milk and 438 pounds of butterfat.

U.S. dairy herds are thus constantly being improved by use of sires known to pass high milk production ability along to their daughters.

Machine Milking Is An Art



Here's how a milking machine works . . . and what happens when you use it carelessly . . .

Condensed from Wisconsin Agriculturist

FAST milking should not mean sloppy milking. Properly operated milking machines save the farmer hours of chore time every day. On the other hand, careless handling and neglect invite a very big and very costly trouble called mastitis.

Veterinarians vigorously agree that udder injury by milking machines is one important cause for mastitis. Constant abuse weakens the udder tissues, leaving them susceptible to attack by mastitis —causing microbes. A normal healthy udder will resist disease or efficiently fight off any infection.

Know Your Milker

This means that a big part of the responsibility for controlling mastitis lies on the farmers' shoulders. He must know how his milking machine works, and take the time to keep it in top condition.

Milking begins with let-down. When you wash the udder with warm water and take a few squirts of milk into a strip cup, you stimulate the release of a hormone called oxytocin from glands in the brain.

Within a minute or so, depending upon the cow, the hormone reaches the udder. Tissues contract and release milk from the chambers where it is stored. The milk flows into the streak canal of the teat. Only this milk in the teat is available to the milking machine. You can see, then, why let-down is vital. Proper stimulation to cause this let-down assures fast and complete milking.

The action of the milking machine is simple. A rubber liner is inserted into a metal teat cup. The space between the two is the outer chamber. The pulsator alternates partial vacuum with atmospheric pressure in this space. The inner chamber within the rubber liner where the teat is drawn is subjected to constant

Reprinted by permission from Wisconsin Agriculturist and Farmer, Racine, Wisconsin

vacuum from the direct mechanical system.

Let-down forces milk into the teat canal under pressure. When the end of the teat is exposed to vacuum, the teat canal dilates and milk flows out. The teat does not need to be inserted deeply into the teat cup for efficient milking. In fact, if the teat cup touches the udder, the opening from udder to teat canal is pinched off.

The vacuum draws blood and tissue fluids as well as milk toward its source. A constant vacuum causes these fluids to accumulate at the end of the teat. The pulsator is intended to counteract this by alternating vacuum with massage.

When vacuum is in both outer and inner chambers, the rubber liner is in normal position and allows milk to flow. Then atmospheric pressure pushes into the outer chamber causing the liner to collapse and massage the teat. This cycle is repeated at a rate controlled by the speed of the pulsator.

As the end of the milking period approaches, the teat shrinks and is sucked deeper into the teat cup. Tissues bunch up into the top of the inner chamber shutting off the opening between milk gland and teat canal.

Large Liners Dangerous

Milk cannot flow into the teat. With no milk in the teat to cushion the impact of the collapsing rubber liner, tissues of the teat are subjected to injurious pressure.

Large bore liners—1 to 1½ inches in diameter—permit more tissue to be drawn into the teat cup toward the end of milking. The slack liner, therefore, exposes more tissue to damaging high pressure. Even the end of the teat may get pinched.

In the average hen's egg, the white accounts for about 58% of the weight, the yolk about 31% and the shell about 11%.

Narrow-bore liners—¾ inches in diameter—eliminate much of the mistreatment, according to authorities. When inserted in the teat cup, the rubber is under tension. This tension serves to absorb some of the pressure exerted on the teat when air is directed into the outer chamber. The small bore also keeps the teat from being sucked into the teat cup.

California dairymen are changing to narrow-bore liners with noticeable results. Of 88 herds surveyed only 8 had switched to narrow-bore liners. But white blood cell counts on these 8 averaged only 786,000 per milliliter of milk compared with 1 million per milliliter in the other 80 herds. The number of white

blood cells is a sensitive indication of udder inflammation.

Fats Weaken Rubber

At this point you can understand why care of rubber liners is important. Fats from milk and skin tissue weaken the rubber. When it loses its vitality and stretches, it offers no protective tension. You can soak liners in lye after a week of use to remove foreign material and restore resiliency. But when they permanently lose their shape, discard them.

After milk leaves the teat, sucking action of vacuum and pushing action of air pressure force milk out of the teat cup and claw. Normally enough air seeps into the inner chamber from around the top of the liner. When the teat cup rides up and touches the udder, no air can get into the liner. The result is that some milk remains in the claw. This reduces vacuum in the system.

A higher vacuum is produced at the tip of the teat than in the milking system. Therefore, when the liner opens in the milking cycle, the milk in the claw rushes back into the liner and around the teat. These conditions make rinsing of teat cups between cows valueless. A small air vent in the claw insures a constant air supply.

Vacuum Speeds Milking

Vacuum permits milk to escape from the teat canal. It allows the weight of the atmosphere to collapse the liner and massage the teat. It holds the teat cups on, and with help from air pressure, directs the milk into the machine pail. The greater the vacuum, the faster the milking process.

But increasing vacuum also increases the pressure with which liners collapse against the teats. The vacuum must be in balance with the size of the liners to avoid abuse to the teats. You should carefully follow machine manufacturers directions in adjusting vacuum level and pulsator speed.

Proper stimulation of let-down, accurate adjustment of vacuum level and pulsator speed, and use of clean, small-bore liners all contribute to a sensible milking routine.

Mastitis Is Costly

The largest single economic loss to dairymen is that caused by mastitis. Acute mastitis is easily detected and usually receives prompt treatment, but the chronic form is often not recognized. Milk production and quality drop and the cow becomes an economic liability. A herd known to be infected with mastitis should receive prompt treatment by a veterinarian. Sanitary management practices are essential for preventing and controlling the disease. —*U.S.D.A.*

Does It Pay to Dehorn Yearling Steers?

How does dehorning affect feed lot performance? South Dakota experiments give some answers . . .

Condensed from
Farm and Home Research

Richard M. Luther

HORNS may add to the appearance of an animal, particularly in the show ring or purebred herd. However, they are objectionable on commercial cattle.

Dehorned cattle produce fewer and less seriously bruised carcasses than horned cattle. This, plus the loss of damaged hides caused by horns, may cost you $1 to $2 per hundred weight on horned cattle. Because horned cattle need more feed bunk and hay rack space and are more aggressive, feed lot disturbances are common.

To find out how dehorning affects yearling steers, we conducted an experiment using horned yearling steers during the spring and summer months of 1956 and 1957. The study included a 40-day recovery period after dehorning, followed by a feed lot trial of 92 days.

Recovery Phase

Thirty-seven horned Hereford steers averaging about 685 lbs. were used in the trials. They were trucked to Brookings in the fall and fed a wintering ration of 2 pounds oats, 2 pounds shelled yellow corn, and 15 pounds alfalfa hay daily. The oats and corn were rolled and mixed. A mineral supplement was offered free choice.

In early April, we dehorned 17 steers, using clippers, and the other 20 horned steers served as the check lot. We did not try to control bleeding; serious hemorrhaging stopped within 2 or 3 hours after dehorning. The two lots continued to receive the wintering ration during the 40-day recovery period. Fill weights were recorded at dehorning and periodically thereafter to note gain or loss of body weight.

During the first 24 hours after dehorning, the dehorned steers lost 27 pounds per head while the horned steers showed a gain of 3 pounds. The heavy loss of

Reprinted from South Dakota Farm and Home Research, S. Dak. State College, Brookings, S.D.

body weight from dehorning was probably due to shock, loss of blood, and failure to consume normal amounts of feed and water. Recovery of this loss for the first 4 days was quite rapid and about 2 weeks after dehorning it was complete.

Lambs under three months of age are most frequently and seriously affected by coccidiosis. Crowding too many lambs and ewes into the same lot may cause heavy losses.

The weight loss of both groups on the seventh day following dehorning is difficult to explain. It may have been due to differences in amount of fill or that the effects of previous handling in weighing were just beginning to appear on that day. In the 19 days following dehorning, the dehorned group gained 25 lbs. per steer and the horned group 39 lbs. per steer. At the end of the 40-day period the horned lot was 91 pounds per steer heavier than at dehorning compared to an increase of 60 pounds for the dehorned lot. Although the horned steers were an average of 2 pounds per steer lighter than the dehorned steers at dehorning, they weighed an average of 29 pounds per steer heavier as the recovery period ended.

Feed Lot Phase

The two lots of steers were immediately placed on a fattening ration consisting, by weight, of 1 part oats and 2 parts shelled yellow corn, both rolled; linseed oil meal; alfalfa and brome hay; and a mineral supplement free choice. The mineral supplement was 3 parts bone meal, 1 part limestone, and 1 part iodized salt.

Dehorning Loss Narrowed

Table 1 gives a summary of the results of the feeding trials. There is some variation in rate of gain and feed efficiency values of the horned and dehorned steers between the two trials. In the first trial the dehorned steers gained 0.5 pound a day faster and were more efficient in converting feed to beef than the

Table 1. Summary of Two Feeding Trials With Horned and Dehorned Yearling Steers During the Dry-Lot Fattening Period.

	Lot I Horned Steers	Lot II Dehorned Steers
Number of Steers	20	17
Number of Days Fed	92	92
Average Weight Per Animal, lbs.		
Initial	775	746
Final	936	923
Average Total Gain, lbs.	161	177
Average Daily Gain, lbs.	1.75	1.93
Feed Per Cwt. Gain, lbs.		
Shelled Corn	390.2	370.1
Oats	191.9	181.9
Linseed Oil Meal	82.1	85.5
Alfalfa Hay	85.5	58.6
Brome Hay	383.9	364.7
Mineral	11.4	8.5
Total Feed	1145.0	1069.3
Feed Cost Per Cwt. Gain	$ 22.31	$ 21.00

horned steers. This may have been due to the considerable amount of disturbance which we noted in the horned lot, caused by aggressive or "bossy" animals. These steers consumed 0.83 lb. less feed per day than the dehorned steers.

Results of the second trial show a decrease in gain of 0.2 pound a day and reduced feed efficiency for the dehorned group. The average of the two trials show that steers which were dehorned gained 0.2 pound a day faster and required 76 pounds less feed per hundred pounds of gain. This resulted in a decrease in feed cost of an average of $1.31 per hundred pounds of beef produced.

A summary of the marketing results is shown in table 2. Both lots of steers were trucked 60 miles to market with partitions used to separate the two lots in transit. The dehorned steers sold for $0.71 per hundred weight more than the horned lot. There was no discount for horns in the selling price of the horned cattle.

Shrinkage in transit averaged over 2 pounds a steer more for the horned steers. Little difference was noted between the two lots in carcass grade and dressing percentage. Five animals in the horned lot carried slight bruises, while 2 animals in the dehorned lot were bruised. Because bruising was slight, the carcasses were not scored or devalued. The bruises appeared to be fresh but we did not determine if they were caused by horns alone. It is possible that some bruising could have occurred after unloading. We used considerable care in handling, loading, and trucking these animals to market. Bruising and hide damage may be more common when cattle have been shipped a considerable distance, overcrowded, or in transit several hours.

Table 2. Summary of Results of Marketing Horned and Dehorned Yearling Steers.

	Lot I Horned Steers	Lot II Dehorned Steers
Number of Steers	20	17
Average Selling Price Per Cwt.	$ 21.05	$ 21.76
Average Shrinkage in Transit, lbs.	27.7	25.5
Carcass Grade		
Prime	0	0
Choice	5	5
Good	15	12
Average Dressing Per cent*	59.2	60.1
Number of Steers Bruised†	5	2

* Based on hot carcass weight.
† Bruising was not severe enough to score or devalue carcass.

During the period from dehorning to marketing, the average daily gain of the horned steers was 1.91 pounds compared to 1.79 pounds for the dehorned steers. Although the difference of 0.12 pound per day is rather small, it indicates that the faster gains made by the dehorned steers during the feeding period were not large enough to offset the effects of the set-back caused by dehorning.

Summary

In this experiment, the dehorning set-back of yearling beef steers amounted to an average of 27 pounds per steer. Recovery was fairly rapid, but approximately 2 weeks were needed for the dehorned steers to equal their initial weight. Meanwhile, the horned steers continued to gain weight and were an average of 29 pounds per steer heavier at the end of the 40-day period. At marketing these steers were an average of 13 pounds a head heavier than the dehorned steers.

In the average of the two trials, the feed lot results indicate that the dehorned steers have a slight advantage in making more efficient and economical gains. However, when you consider the period from dehorning to marketing, these steers made less total gain than the horned steers. This means that the dehorned steers either have to gain faster during the recovery period or gain considerably more than 2 pounds a day while on feed to give them an advantage over the horned steers.

Egg Yolk Test Aids Mastitis Research

A bacteriological test which distinguishes between the organisms causing severe mastitis and those of the same type causing a less severe form of the disease may help simplify mastitis research in the future.

University of Wisconsin researchers Winifred Reid, J. B. Wilson, and Joseph Simon have found that micrococcus pyogenes organisms isolated from udders of cows with acute staphylococcal mastitis react different in an egg yolk medium than those from normal cows or cows with a chronic form of staphylococcal mastitis.

The egg yolk test is one previously used in research on human staphylococcal infection. The organisms in milk from acute mastitis cause a distinct cloudiness of the egg yolk medium; those from normal milk and from chronic staphylococcal infection usually do not cause cloudiness.

The egg yolk test looks like a good way to separate the very harmful and less harmful types of this organism. Such identification is often desirable or necessary in research work on this number one dairy cow disease. Presently this test is being used to try to determine the source of the organisms causing acute mastitis.

—University of Wisconsin

Balance Rumen As Well As the Ration

A Hollander stresses the importance of a feeding factor you may not appreciate . .

Condensed from The Dairy Farmer

A. M. Frens, Agricultural Experiment Station, Hoorn, Holland

IT IS extremely difficult to keep a cow healthy on a ration that is sufficient in all respects but is given entirely in the form of meal. Such a ration hampers the layered form of the rumen content—one of the important conditions for an efficient cellulose-fermentation.

But powdered feeds are not the only hampering factors for optimal rumen activity. Very young and tender grass or clover can also give structural difficulties by packing in the rumen so compactly that the layered structure of the contents is lost.

Decreases in the fat content of the milk, observed on early spring-pastures, can be related to this lack in structure-giving properties.

Besides the structure, the type of diet is important.

In the rumen exists a certain competition between the cellulolytic fatty-acid forming bacteria and the bacteria that produce chiefly lactic acid.

If the diet is very rich in sugar or easily-fermentable starch, excessive lactic acid formation can impair cellulose digestion.

Improved health and increased milk production of dairy cows can easily overcome the added expense of installing comfort stalls, says a Penn State extension dairyman. The yoke type stanchion is out of date, he believes.

We mentioned last winter the cellulolytic activity of the rumen flora from cows that received molasses silage of good quality as the only roughage. On this ration there was a distinctly lowered activity in comparison with cows receiving unmolassed wilted silage with a high dry matter content.

After finding this difference we added 1 kg. of wheat straw to the daily molassed silage ra-

Reprinted by permission from The Dairy Farmer, Lloyds Chambers, Ipswich, England

tion and about a week after we had done this the cellulolytic capacity of the rumen flora had increased appreciably.

It must be considered as advisable to incorporate in the daily ration of dairy cows at least 8 lb. of well-cured hay. Liberal amounts of properly-made silage can be added to this basal ration without disturbing the structural set-up of the rumen content.

In that way it is easily possible in the Netherlands to provide sufficient nutrients for maintenance and the production of three gallons average milk from roughage only.

For high productive cows concentrates have to be added. But these expensive concentrates give the highest profits in cows with a well-balanced rumen function.

Organize Attack on Fire Ant

Texas' first organized effort to eradicate the Imported Fire Ant has begun in Hardin county. Hardin is one of six southeast Texas counties invaded by the ant. The control program was mapped by a committee composed of landowners and agricultural representatives.

"An area of about 200,000 acres in Hardin county is infested, but not near that many acres need treatment," Dr. Freeman Fuller, extension service entomologist said. "Some of the acreage included is woodland where the ant does not infest except where openings allow sunlight on the ground."

Cost of control will average about $5.00 per acre for application of recommended insecticides such as dieldrin, heptachlor or chlordane. Application can be made by airplane or ground equipment. In an organized effort such as in Hardin county, the pest control branch will pay approximately 50 per cent of the total cost. The USDA has a total of $2.5 millions set aside for fire ant control of which Texas gets a part.

The Imported Fire Ant has migrated to Texas from the east and the effort is to eradicate it before it migrates and causes further damage. It feeds on small plant seedlings, kills birds and even baby calves have been reported killed. The ant hills prevent mowing of pastures and cattle grazing. If cropland is infested, laborers do not like to harvest the crops, and the mounds complicate the use of machinery. *—Texas Extension*

How To Feed Hay

Here's how top dairymen make their hay pay . . .

Condensed from Checkerboard Service Magazine

CAREER test cow milkers, who guide the feeding and handling of the nation's official production champions, may differ in their feeding systems, but they all agree that getting a lot of hay into a cow is essential if she is to produce all the milk she has in her.

Dairy nutritionists tell us that 70 per cent of a cow's nutritive requirements are normally answered through roughage. In most of America, weather and other factors make hay the primary consideration as far as roughage is concerned, with an influence on milk production exceeding by a wide margin that of silage and pasture.

Top dairymen, like the test cow milkers, also can be counted upon to take extra-special pains with hay to help them achieve the big herd averages and high milk - per - man - per-year ratings which have become the mark of the professional milk producer. Here are some "tips from the experts" which not only will help your cows get as much good as possible out of your hay if it's a bit stemmy, like some early crops last year, but will also help you increase hay consumption, avoid waste, and get the most out of whatever hay crop you may be fortunate enough to have stored away.

1. To increase total hay consumption, feed hay OFTEN!

Test cow men feed hay as often as six times a day, sweeping away stems each time new hay is fed. Practical dairymen say it pays to feed three times a day in winter, and, while inconvenient, a fourth feeding just before you go to bed will usually pay.

Cows seem to respond to fresh hay. They'll even eat a little more if all you do is stir up the hay already in front of them.

When cows eat hay, they first nose around, picking up leaves

Reprinted by permission from Checkerboard Service Magazine, St. Louis 2, Missouri

and the tenderest parts. Then they go after the fine stems.

After a cud-chewing rest, they will come back and eat a few coarse stems, but with little or no enthusiasm. This is just as well, because the stems don't do the cow any particular good.

The firefly is not a fly—it is a beetle.

By feeding often, you keep the cows' interest in hay aroused, keep the most palatable portions in front of them for a longer period of time, and thus increase consumption of that part of the hay that builds body and makes milk.

2. Keep mangers CLEAN.

Once cows eat what they think is good, they usually quit eating, and nothing short of actual starvation will force them to eat what's left.

No good dairyman can afford to let his cows get even hungry, let alone starved to the point of eating what they don't relish.

Before every hay feeding, take away what's left of the previous feeding. Sometimes this will be worth feeding to other livestock. In the old days, many dairymen fed such hay to horses. Most of the time, in this day and age, it won't be good for anything, not even bedding. (Stems are the least absorbent parts of the hay crop.)

A good suggestion: Add it to the manure and take it back on the land.

Once every few days, sweep out mangers with a broom. Hay dust is dirty and cows do not like dirt. Scrub mangers periodically. Scrape them out with a hoe every so often and douse with a good disinfectant solution.

3. Avoid WASTE.

Cows love to toss hay out of their mangers and step on it.

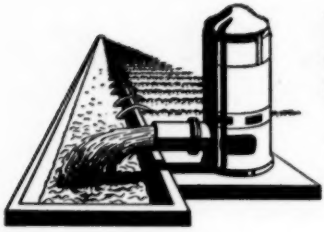
If you feed out of a bunk, "V" type dividers discourage cows tossing their heads from side to side and throwing hay out on the ground or floor.

In stanchions, some kind of movable partition between cows' heads will keep hay where it belongs and will also keep "boss" cows from stealing their less aggressive neighbors' rations.

Break baled hay up thoroughly when you feed it. A lot of baled hay is wasted when it is served up to cows still packed tightly. A cow can easily toss a fairly heavy "flake" of baled hay away, and waste the equivalent of a whole forkful of loose hay in the process.

Feeding hay *often* in *clean* mangers and taking steps to avoid *waste* will help you get more milk to your market. It'll also help you get the most from your hay supply, regardless of its condition.

Shaping the Land for Irrigation



The topography of a field or farm can be changed to adapt it for flooding or furrow irrigation . . .

Condensed from Implement and Tractor

Ivan D. Wood

IRRIGATION was practiced in North America long before Columbus reached our shores. There are remains of ancient systems which date back to about 700 A.D.

We do not know much about the builders of these works, but it is known that many acres of land were cultivated by them and that at least 20 settlements were situated along the canal banks. It is presumed that a prosperous irrigated agriculture existed for 600 years and then vanished. Perhaps some of the ills which sometimes beset present day irrigators may have spelled their downfall. It may have been waterlogged soils and alkali from excessive water application or it may have been lack of fertility.

At present we have four ways of applying water to the land—by flooding it over the surface, by furrows, by sprinkling, and by sub-irrigation. In this article, we will consider the flooding and furrow methods.

Rarely does nature leave the land surface smooth enough to permit surface irrigation to be practiced without changes being made in topography. This process is referred to as "land leveling", "land smoothing", or "land forming". The latter term will be used since it more nearly describes methods now in use.

The pioneer irrigator was forced to accept the land surface about as nature left it. He had only a team and a hand-operated slip scraper with which to work. He could remove some high spots and fill low ones. The job of preparing an entire farm for irrigation might well occupy an entire lifetime.

The advent of the tractor and large earth moving machinery quickly changed this picture. The back-breaking work of the early day irrigator can now be accomplished in a few days time. The

Reprinted by permission from Implement and Tractor, 1014 Wyandotte, Kansas City 5, Mo.

entire topography of a field or a farm can be formed to suit the type of irrigation system best suited to the soil, the water supply, the climate, and the crops to be grown. Often this is not a cheap job. It may require a major expenditure and should be planned with care by experienced persons.

To avoid cattle bloat on pasture containing ladino clover, seed only one-fourth pound per acre in mixtures with other grasses and legumes, say agronomists.

Land forming is a permanent thing. Money spent for it is a capital investment which increases the value of the farm. Once well done, its benefits pay good dividends for more then one lifetime. Some yearly maintenance is required, as we will show later, but the major improvement does not deteriorate with age. If poorly designed and constructed, it may become obsolete and need to be brought up-to-date.

Land forming should do the following things:

1. Provide a land surface upon which irrigation water can be applied with efficiency of labor and best use of water.

2. Provide good surface drainage when drainage is needed, as in the humid and sub-humid states.

3. Protect the land from damaging flood waters from neighboring streams or runoff from higher areas.

4. Prevent erosion from natural precipitation and water applied for irrigation.

5. Provide a field surface over which modern agricultural machinery can be used with efficiency and without damage to mechanical parts.

The farmer who knows his soils and the slope of his land can often do a creditable job of land forming without technical assistance. On large and more complicated jobs, however, mistakes can be very costly and may result in loss of part or all of a season's crop.

The information which the irrigation engineer or farm planner needs before designing a land forming job is as follows:

1. A Topographic Map

This map shows how the land slopes. It indicates the high and low areas and spots the location of roads. drains, irrigation wells, irrigation ditches, and all other permanent features. This map is usually made by staking the field or farm in 100 foot squares and taking a reading with a leveling instrument on the corner of each square.

2. Soils Map

In irrigation nothing is more important than the soil. The soils map outlines the various kinds of soils in the field, indicates their depth, their water holding capacity, and how fast water will enter. It also shows how much top soil can be safely removed in the land forming process.

3. Water Supply

The availability and the quality of the water may greatly influence the type of land forming done on any farm. If the available flow is small, as would be the case from a weak well, a different pattern of land forming might be used than if the flow were from 6 to 10 cubic feet per second. Some irrigation waters contain chemicals which accumulate in the soil and must be leached out from time to time. This calls for a type of land forming which will permit flooding the surface to carry the chemicals down below the root zone of the crops. The same treatment is often necessary on soils which naturally contain alkali or soluble salts.

4. Type of Crops to be Grown

If the farmer intends to grow row crops exclusively, as might be the case in the High Plains area of Texas, less careful land preparation may be used than would be the case if he planned on growing hay pasture or small grains where border type irrigation gives best results. With border irrigation, side slope in the field is removed and a better surface is required!

Little boy (on a transcontinental train): "Mother, what's the name of the last station we stopped at?"

Mother: "Don't bother me now, dear. I'm reading. Why do you ask?"

Little boy: "Because sister got off there."

No matter how the system is constructed, whether all at once or piecemeal, it is well to complete a plan for the entire farm so far as water application, drainage, and flood protection are concerned. This is especially true if underground pipe lines are to be used. It is essential that all parts of the system be designed for the job that they will eventually be called upon to perform.

A good job of land forming cannot be done until the type of irrigation system to be used is determined. Some of the factors to be considered in system planning are:

1. Slope or Gradient

At one time it was thought that where gravity irrigation systems were to be used, the land should have considerable slope to permit water to run from one end of the field to the other. In

modern planning, much less slope is used. If the natural slope of a field is 3½ inches per 100 feet, for example, this might now be reduced to 1½ inches per 100 feet, in the land forming process. This allows for the use of large flows of water in furrows and borders without causing erosion. Land is graded perfectly flat in some areas to allow the use of basins which are flooded to a predetermined depth with irrigation water. Slopes of 1 inch per 100 feet have been found to give sufficient drainage under certain conditions, even in humid areas.

2. Length of Run

The length of run is the distance water is permitted to travel in a furrow or in a border strip. This may be the distance from the supply lateral to the lower end of the field or from one supply lateral to another. Length of run is determined by the flow of water available, the rate the soil will take water, and the amount of rain water which must be carried away at times.

3. Soil Texture and Structure

The texture and structure of the soil may affect the type of system used and the type of land forming which must be done. Light, sandy soils often take water at an excessive rate—that is, from three to five inches per hour. Irrigation water placed on this soil by surface methods would disappear in a short distance and might be lost by deep percolation far below the crop root zone. The solution might be the use of short runs and large flows of water, or a sprinkler system. A careful examination of the soil will determine how much water it will hold, per foot of depth, available to plants. Light, sandy soils may hold only ¾ of an inch of water per foot available to plants while a heavy soil may hold as much as two inches. It would be necessary to plan a system which would provide frequent light irrigation on the light, sandy soil. The heavier soil would require less frequent but heavier applications.

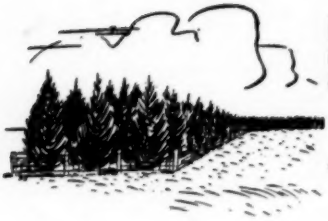
New Ways to Check Baby Pig Anemia

Anemia in baby pigs — a widespread killer caused by iron deficiency — can be drastically reduced by any of three methods.

Baby pig losses from anemia have been estimated as high as 30 per cent, reports J. E. Oldfield, Oregon State College animal husbandman, who headed recent research. The three methods tested by Oldfield are providing a pan of clean soil in the farrowing pen, an iron solution drench, or an injection of an iron preparation. All three methods prevented death losses from iron deficiency anemia.

—Oregon State College

The Conservation Reserve Program Promotes Good Land Use



Both landowners and the public gain when marginal crop land is planted to grass and trees . . .

Condensed from
Journal of Soil and Water Conservation

J. K. Vessey, U. S. Forest Service

THE Conservation Reserve Program provides a practical basis for reducing the production of unneeded agricultural products. Furthermore, it creates incentive for converting the many cultivated acres on America's farms, which admittedly are not good cropland, to uses more in keeping with their capabilities and needs. Figuratively speaking, this is a program where the landowner and his supporting public might very well "give 'em both barrels!"

The potentialities of the Conservation Reserve phase of the Soil Bank Act were very little understood or recognized in the early stages of the program. Its more glamorous but controversial sister, the Acreage Reserve, got most of the attention for obvious reasons. Full participation in the Acreage Reserve Program would make the most direct curtailment of critical surplus crops; its application is in keeping with the understanding and philosophy of farmers; it is relatively simple in sign-up procedures and administration and it is operated on a short-time basis. Landowners are not committed for more than a year in advance. On the other hand, qualification under the Conservation Reserve has become better understood by the administrators, technicians, landowners and interested public, it has grown in stature to the point where it is now a most practical and worthwhile phase of the Soil Bank Act. Its goals are recognized as being worthy of public support and financial participation. Landowners by the thousands are recognizing the worthiness of the program and are availing themselves of this incentive to take immediate steps to put their less productive land into

Reprinted by permission from Journal of Soil and Water Conservation, Des Moines 14, Iowa

grass, trees and other cover suitable for wildlife habitat.

The farmers and ranchers who participate in the Conservation Reserve are definitely aligning themselves with the growing conservation movement and are making definite contributions toward helping to assure the future of our renewable natural resources.

There continues to be a need to shed more light and focus more attention on the Conservation Reserve and its potentialities.

A few words about how the program operates:

When a farmer, rancher or other qualified landowner decides to participate in the Conservation Reserve Program, he enters into a contract with the Secretary of Agriculture in which the Secretary, through the County Agricultural Stabilization and Conservation Committee (ASC), agrees to provide two types of payment to the landowner:

1. Cost Sharing for Establishing Practices

Up to 80 per cent of the cost of establishing the practice as determined and approved by the State ASC Committee.

2. Annual Land Rental

Rates vary by counties and states, but the national average is about $10 per acre per year extending over the term of the contract.

In turn, the farmer or landowner agrees to:

a. Comply with any acreage allotments in the six critical crops . . . wheat, corn, cotton, rice, peanuts, tobacco.

b. Maintain the selected practice on the land placed in the Conservation Reserve for the duration of the contract. Contracts run from three to five or ten years if there is acceptable land cover already on the land, five to ten years if legumes are established, five to ten years for tree and shrub plantings for specific erosion control areas and wildlife habitat plantings, and ten years for tree plantings primarily for the production of wood products.

c. Refrain from harvesting or otherwise utilizing the production from the land under contract except wildlife. (No Christmas trees, greens or boughs can be harvested.)

d. Protect the areas from grazing and wild fire.

e. Control the spread of noxious weeds.

In general, eligible land includes all areas previously used for cultivated crops or tame hay. The ASC personnel administering the program establish a "base acreage" figure for each farm computed on the history of operation. There is no limitation on the maximum number of acres that can be "banked," but $5000

is the maximum permitted a farmer in annual payments during any one year.

The Program is administered from the office of the Secretary of Agriculture by the Agricultural Conservation Program Service. Execution of the program on the ground is through the Department's Agricultural Stabilization and Conservation Agency, with technical assistance provided by the U. S. Forest Service with the cooperation of the state foresters. The Extension Service has the important responsibility for providing farmers with information regarding the availability of the program.

The 1958 Conservation Reserve Program encourages farmers and landowners to place entire farms in the "Soil Bank" and places a special emphasis on increasing tree plantings. When all of the eligible land on the farm is retired from agricultural production and is planted to trees, county ASC committees are authorized to increase annual payment rates, where such increases are justified. Five- and ten-year contracts are offered, at the option of the farm owner, when land is devoted to tree or shrub plantings for windbreaks, shelterbelts or wildlife habitat development. Ten-year contracts are required when trees are primarily for the production of wood products.

Castration of male animals should be done as early as possible, according to Purdue veterinarians. Pigs, calves and lambs usually can be neutered when they are less than two weeks of age. The earlier the operation is performed, the less shock there is to the animal, and the less likelihood of infection occurring. Castration is considerably more dangerous in the hot part of the year because of possible maggot invasion of the wound. Furthermore, the larger the animal, the greater the physical effort necessary to handle in order to perform the operation.

It is becoming increasingly evident that tree planting is a popular conservation choice by farm landowners who sign up for the Conservation Reserve. This popularity is undoubtedly based on the fact that landowners realize wooded areas provide multiple-use by protecting the soil from erosion, regulating the infiltration and flow of water, providing suitable habitat for wildlife and at the same time producing valuable crops of needed wood products.

The community and the nation share with the farmer in the benefits that are to be derived from trees and shrubs planted on his diverted cropland acres. Well-managed woodlands in combination with other recognized good soil practices on the farm are a key factor in regulating the quantity and quality of water from farm watersheds which is of inestimable benefit to downstream users. A farmer seldom, if ever, harvests the entire game crop which is produced on his land. Many others share in the harvest. Wood products produced on the farm not only provide income to the farmer, but create payrolls and profits to the people of the local community and the communities where the raw material is processed into final form.

It would be a mistake to overlook the fact that the Conservation Reserve is just one more tool for advancing the needed conservation program in the nation.

The extent to which farmland owners participate in this particular program must be determined in the light of the hard fact that their farm unit is their main source of livelihood. Any cash crop curtailment or diversion in the interest of desirable conservation practices must be compatible with the owner's economic needs. The Conservation Reserve Program provides a financial incentive which will make it possible for an owner to participate in conservation measures to a greater extent than would ordinarily be possible. Participation in the program is voluntary. The final decision rests with the farmer.

Where's the Cat-ch in This Opportunity?

An 1875 newspaper advertisement as quoted in *Geographical Review.*

Glorious opportunity to get rich! — We are starting a cat ranch in Lacon with 100,000 cats. Each cat will average 12 kittens a year. The cat skins will sell for 30c each. One hundred men can skin 5,000 cats a day. We figure a daily profit of over $10,000.

Now what shall we feed the cats? We will start a rat ranch next door with one million rats. The rats will breed 12 times faster than the cats. So we will have four rats to feed each day to each cat.

Now what shall we feed the rats? We will feed the rats the carcasses of the cats after they have been skinned.

Now get this! We feed the rats to the cats and the cats to the rats and get the skins for nothing.

ONE YEAR CONTINUING INDEX

BEEF CATTLE

Meat Type Beef ..... July 1957
Which Feeding Program ..... Sept. 1957
When Beef Cattle Prices Double? .. Sept. 1957
Silage—Cut-Cost Cattle Feed ..... Sept. 1957
Holstein Steers for Beef ..... Oct. 1957
A. I. for Beef Herds ..... Oct. 1957
Self-Feed Cattle ..... Nov. 1957
How to Buy Feeder Pigs ..... Nov. 1957
Calving Percentage Measures Success Dec. 1957
What It Costs to Produce Beef ... Dec. 1957
Push-Button Feed Lot ..... Dec. 1957
Pays to Fit, Show ..... Jan. 1958
Coming: Sex Control ..... Feb. 1958
Watch Beef Wintering Costs ..... Feb. 1958
Performance Testing Organized .. March 1958
Lasater Breeds for Beef ..... April 1958
Weight Steers Lose in Transit ... April 1958

CONSERVATION

Will Grasses Be Destroyed? ..... May. 1957
Crown Vetch Controls Erosion .... Jan. 1958
Good Fishing in Farm Ponds ..... Feb. 1958

CROPS

Grow Tall Plants ..... May. 1957
Plow, Plant Corn ..... May. 1957
Wheel Track Corn Planting ..... July 1957
X-tra Corn Yields ..... July 1957
Increase Field Efficiency ..... Sept. 1957
Corn Ears Tell A Story ..... Dec. 1957
Witloof Chicory 75¢ Pound ..... Jan. 1958
Dwarf Corn Advantages ..... Jan. 1958
One Year Rotation, Hay & Corn .. Feb. 1958
Does Wheat Grower Have Choice? .. Feb. 1958
Minimum Tillage Cuts Corn Costs .. Feb. 1958
Story of the Potato ..... Feb. 1958
More Money With Continuous Corn March '58
What To Do With Wet Corn .... March 1958
Seed Treatment, Low-Cost Insurance April 1958
Steps to Higher Soybean Yields .. April 1958
Convert to Wheeltrack Corn ..... April 1958

DAIRY CATTLE

Developing Purebred Dairy Herd ... Sept. 1957
Dairymen Like Green Chopping .... Sept. 1957
Teamwork for Breeding Record .... Oct. 1957
Time Breeding for Conception ..... Oct. 1957
Ways to Boost Dairy Income ..... Oct. 1957
The WADAM System ..... Oct. 1957
Bacterial Counts, Quality Milk .... Oct. 1957
Milking Parlors ..... Oct. 1957
One Bull, 2257 Calves ..... Oct. 1957
Report on Loose Housing ..... Oct. 1957
One Cow, 10 Calves a Year ..... Oct. 1957
Checklist for Culling ..... Oct. 1957
What Makes an A.I. Bull? ..... Oct. 1957
What Bedding Is Best? ..... Oct. 1957
Showring Ruddy Nonsense ..... Nov. 1957
Should You Milk More Cows? .... Dec. 1957
Milk in Bulk Tanks ..... Dec. 1957
Carnation's Planned Breeding .... Dec. 1957
Started with One Good Cow .... Nov. 1957
Help Freshening Cows ..... Jan. 1958
Feeding By Conveyor ..... Jan. 1958
Patrick's Keep Good Breeding .... Jan. 1958
Dairy Barn Ventilation ..... Jan. 1958
Planning Stall Barns ..... Jan. 1958
Is Showing Right or Wrong? ..... Feb. 1958
Coming: Sex Control ..... Feb. 1958
Antibodies in Milk, Human Disease Feb. 1958
Dairy Management Test ..... March 1958
Expect from Concentrated Milk .. March 1958
How Much Grain for Dairy Cows March 1958
Cut the Feed Bill ..... April 1958
Feed Cows Once A Day ..... April 1958
Size Comes First in Denmark ... March 1958
Profitable Dairy Management ... March 1958

FARM BUILDINGS & SHOP WORK

Cribs and Bins Pay ..... July 1957
Self-Feeding Silos ..... Sept. 1957
Feed Automatically in Stall Barn .. Oct. 1957
New Dairy Barns ..... Oct. 1957
Longer Service Fences ..... Dec. 1957
Power Tools for the Farmer ..... Dec. 1957
Tractor Maintenance Pays ..... Dec. 1957
Make Strong Concrete ..... Dec. 1957
Portable Electric Drill ..... Dec. 1957
Mobile Farm Shop ..... Dec. 1957
Do Your Arc Welding ..... March 1958

FARM MANAGEMENT

Cross Breeding Livestock ..... July 1957
Family Farm 1957 Style ..... July 1957
Compensation to Tenants ..... July 1957
Uncut Hay on Soil Bank Acres .... Sept. 1957
Make Labor Count ..... Oct. 1957
More Land, More Livestock? ..... Oct. 1957
Farm Outlook 1958 ..... Nov. 1957
Magic Word—Management ..... Nov. 1957
What Can Soil Bank Do? ..... Nov. 1957
Social Security ..... Nov. 1957
Tax Scandal ..... Nov. 1957
Farm Credit A Tool ..... Nov. 1957
Ideas to Save Money ..... Nov. 1957
What's New in Farm Leases? .... Nov. 1957
Financial Headaches to Avoid .... Nov. 1957
Use Grain Futures Market? ..... Nov. 1957
Banker, Farmers Friend ..... Nov. 1957
Farm Partnerships ..... Nov. 1957
Property, Liability Insurance ..... Nov. 1957
Farm Tax Accounting ..... Nov. 1957
Farm Machinery Unprotected ..... Dec. 1957
More Acres or More Cows ..... Jan. 1958
Save Time, Money on Chores ..... Jan. 1958
Small Farmer Notice to Quit ..... Jan. 1958
Farm Prospects for 1958 ..... Jan. 1958
Outlook for 1958 ..... Jan. 1958
Plan Tax Paying ..... Jan. 1958
How Big for Family Farm? ..... Feb. 1958
Feed, Key to 1958 Profits ..... Feb. 1958
Increase Net Profit ..... March 1958
Hullabaloo About Vertical Integration ..... March 1958
Losing Ag Race to Russians? .... April 1958
Integration in Farming ..... April 1958

FARM EQUIPMENT & MACHINERY

Best Way to Harvest Corn ..... July 1957
Drying Corn on Farm ..... July 1957
Hay Crushers and Conditioners .... Sept. 1957
Farm Equipment of Future ..... Sept. 1957
Pipeline Milking ..... Oct. 1957
Buying a Bulk Tank ..... Oct. 1957
Cut Tractor Fuel Costs ..... Dec. 1957
Do You Have "Tractor Sense" .... Dec. 1957
How To Buy a Used Tractor ..... Dec. 1957
Your Tractor Air Cleaner ..... Dec. 1957
Forage Handling ..... Dec. 1957
How To Adjust a Plow ..... Dec. 1957
What a Farm Truck Costs ..... Dec. 1957
Tractors — Then and Now ..... Dec. 1957
Tips for Portable Engine Care .... Dec. 1957
Farm Machinery Costs ..... Dec. 1957
Have Your Corn Picker Ready .... Dec. 1957
Machines Ease Grain Harvest ..... Dec. 1957

ONE YEAR CONTINUING INDEX

Factors in Buying Machinery .....Jan. 1958
Electric Motor Maintenance .....Feb. 1958
Power Feeding .....Feb. 1958
Revolution Greenup County .....Feb. 1958
Custom Rates for 1958 .....March 1958
Farm Mechanization in Russia ..March 1958
Poor Valves Hog Power .....March 1958
Selecting A Tractor .....April 1958
Make Idea Pay Off .....April 1958

FEEDS
Grain Mixtures for Dairy Cows ...July 1957
Save on Feed Processing .....July 1957
What's New in Feeding .....Feb. 1958
Soon Nothing But Pellets .....Feb. 1958
Sorghum Makes Good Feed ....March 1958
How Much Grain for Dairy Cows March 1958
Feed Once A Day .....April 1958
Implant Hormones or Feed Them? April 1958

FERTILIZERS
Speed Corn Growth and Maturity ..July 1957
Superphosphate with Manure .....Feb. 1958
Look at Liquid Fertilizer .....March 1958
Fertilizer Cheapest Feed .....March 1958
Miracle Rock: Lime .....March 1958

FORESTRY
Farm Forest Mean to You .....Nov. 1957
Wood Best Farm Crop .....Jan. 1958

FRUIT
Dwarfs in Your Backyard .....April 1958

HAY AND HAY CROPS
Increase Profits from Forage .....July 1957
Easier Interseeding with Corn ....July 1957
You'll Like Vernal Alfalfa .....Sept. 1957
Best Time To Cut Forage ....Sept. 1957
What a Mow Drier Costs .....Sept. 1957
Quizzing Forage Expert .....Sept. 1957
Tips for Testing Hay Moisture .....Sept. 1957
Good Forage, High Quality Feed ..Sept. 1957
Harvest When It's Right .....Oct. 1957
Efficient Forage Handling .....Dec. 1957
Pelleting Boosts Feed Value .....Jan. 1958
Better Alfalfa Varieties Coming ...Jan. 1958
Control Alfalfa Weevil .....Feb. 1958
Grading Hay for Quality .....Feb. 1958
Report on Creeping Alfalfa ....March 1958

HOGS
South's Boom in Pigs .....July 1957
Early Weaning Baby Pigs .....Sept. 1957
Corn Silage for Sows .....Sept. 1957
Better Pasture, Hay with Irrigation Sept. 1957
Changing Hog Markets .....Oct. 1957
44 Steps to Hog Profits .....Oct. 1957
Hogs for Greater Returns .....Nov. 1957
What to Pay for Feeder Pigs ....Nov. 1957
Bigger Returns from Hogs .....Dec. 1957
Hogs, Full Time Job .....Jan. 1958
Inside the Hog House .....Feb. 1958
Wean Pigs You Farrow .....Feb. 1958
Forecast Hog Prices .....Feb. 1958
Fecundity First with Pigs .....March 1958
1500 Hogs a Year .....March 1958
Will Hog Prices Go Up? .....March 1958
Hog Contract Farming .....April 1958
Prospects for Pig A.I. .....April 1958
Leasing Hog Breeding Herds .....April 1958
Pigs, Prices, Politics .....April 1958

IRRIGATION
Roll-up Ditches .....May, 1957
Irrigation Pays for Self .....July 1957
Irrigation . . . .Jan. 1958

INSECTS AND INSECTICIDES
Treat Your Corn Land .....July 1957
Can We Stop Alfalfa Aphid .....Sept. 1957
Fury of Fire Ant .....Jan. 1958
Control Alfalfa Weevil .....Feb. 1958
Stop Cattle Lice .....Feb. 1958
Corn Planter Control Insects .....April 1958
Corn Borer Population High .....April 1958

PASTURES
Cows Maintain Pasture Fertility? ..July 1957
What Is Pasture Worth? .....Sept. 1957
Dairymen Like Green Chopping ....Sept. 1957
Experience with Zero Pasture ....Oct. 1957
$500 Acre Pasture .....Oct. 1957
Don't Discount Bluegrass .....April 1958

POULTRY
Champion Geese .....July 1957
Broiler Nutrition in 1960 .....Sept. 1957
80,000 Broilers .....Oct. 1957
Get Most from Every Layer .....Nov. 1957
Likes Growing Broilers .....Jan. 1958
Concentrates Cut Costs .....Feb. 1958
10,000 Layers, Quits at 5 P.M. March 1958
New Poultry Inspection Law .....April 1958

SHEEP AND GOATS
Performance Test Sheep .....Nov. 1957
10 Points Ewe Care .....Jan. 1958
Over-Eating in Feeder Lambs .....Feb. 1958

SILAGE
Can't Beat Corn for Silage .....July 1957
Oats for Silage .....Sept. 1957
Make Pasture Silage .....Sept. 1957
Trench Silos Not for Me .....Sept. 1957
Silage, Cut Cost Cattle Feed .....Sept. 1957
Corn Silage for Sows .....Sept. 1957
Good Silage, Dairy Profits .....Oct. 1957
Self-Fed Silage in Britain .....March 1958
Cows Sleep, Eat on Silage .....April 1958

SOILS
Don't Guess, Test Soil .....May, 1957
What's in Soil .....Feb. 1958

VETERINARY
Penicillin Promises Bloat Control ...Sept. 1957
Trim Hoofs to Trim Costs .....Oct. 1957
Causes Low Fertility in Cattle ....Oct. 1957
Prevent Hoof Rot .....Oct. 1957
Keep Calves Healthy .....Oct. 1957
Penicillin Promises Bloat Control ...Oct. 1957
Stop Cattle Lice .....Feb. 1958
What's New in Feeding? .....Feb. 1958

WEEDS
Attack Weeds in Corn .....July 1957
Rid Your Farm of Quack .....Jan. 1958

MISCELLANEOUS
Is Bushel Outmoded? .....July 1957
Up-to-Date Farm Philosophy .....July 1957
My Pond .....Sept. 1957
Morgan Horses .....Nov. 1957
Roadside Stands .....Nov. 1957
Farming in Spain .....Nov. 1957
Trap the Wily Fox .....Dec. 1957
Ponies for Profit .....Dec. 1957
Tips Safe Winter Driving .....Jan. 1958
Rat Control Program .....Feb. 1958
Buy and Train A Stock Dog ...March 1958

Best Farm Books For Your Library

A good farm book can substitute for a lot of unhappy farming experience and cost you a great deal less in time and money.

ORDER BOOKS DIRECT FROM THESE PUBLISHERS—Identifying numbers at left appear also in book title descriptions to tell source of each book. Send $.15 per book to cover postage in U. S. For shipment to Canada and other countries, estimate postage amount required and include with your payment.

(1) Exposition Press, Inc., 386 Fourth Avenue, New York City 16.
(2) College Science Publishers, P.O. Box 798, State College, Pennsylvania.
(3) Iowa State College Press, Press Building, Ames, Iowa.
(4) Cary Printing Co., Sumter Street, Columbia, South Carolina.
(5) Springer Publishing Co., 44 E. 23rd Street, New York 10, New York.
(6) John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, New York.
(7) Ronald Press Co., 15 E. 26th Street, New York 10, New York.
(8) Prentice-Hall, Inc., Educational Book Division, Englewood Cliffs, New Jersey.

Law and the Farmer. Beuscher. 1955. (Source 5) $4.95
Profitable Farm Management. Hamilton and Bryant. 404 p. 1956. (Source 8) $6.40

GENERAL FARMING

Exploring Agriculture. Evans and Donahue. 366 pages. 1957. (Source 8) $5.85
Feedstuffs: Dr. Rudolph Seiden and Prof. W. H. Pfander. An encyclopedic handbook. 600 pages. (Source 5) $8.00
Midwest Farm Handbook. 400 pages. 1954. (Source 2) $3.00
Agriculture Unadorned. L. S. Wolfe. Background, evolution of farming. (Source 4). Cloth .....$2.50. Paper $1.50

LIVESTOCK AND POULTRY

Feedstuffs Handbook. Seiden and Pfander. 1957. 600 pages. (Source 5) $8.00
Livestock and Poultry Production. Bundy and Diggins. 608 p. 1954. (Source 8) ..$6.55
Animal Breeding. Winters. 1954. (Source 6) $5.75
Hatchery Operation and Management. Funk & Irwin. 1955. 349 p. (Source 6) $6.5(
Feeding Poultry. Heuser. 2nd Edition. 1955. 632 pages. (Source 6) $7.50
Commercial Poultry Production. Marble and Jeffrey. (Source 7) $6.00

VEGETABLES, HORTICULTURE

Vegetable Production and Marketing. Work & Carew. 2nd Edition. 1955. 537 pages. (Source 6) $4.72
Practical Horticulture. Shoemaker & Teskey. 1955. 374 pages. (Source 6) $4.20

FARM SANITATION

Rural Water Supply and Sanitation. Wright. 2nd Edition. 1956. Approximately 358 pages. (Source 6). Probably $4.90

FARM MARKETING

The Grain Trade: How It Works. James S. Shonberg, Uhlmann Grain Co. A comprehensive treatment by a man who should know the grain market. (Source 1) ..$6.00
Profitable Roadside Marketing. Donaldson, Johnstone. 1956. (Source 2) $2.00

VETERINARY

Livestock Health Encyclopedia. Seiden. 624 pages. 300 Illus. 1951. (Source 5) $7.50

This listing of farm books is a service to our readers and to publishers. For information about costs, write to Farmer's Digest, Fort Atkinson, Wisconsin.

BEEF CATTLE

Beef Production. Diggins and Bundy. 343 p. 1956. (Source 8) $5.85

DAIRY CATTLE AND DAIRYING

Dairy Cattle. Yapp & Nevens. 4th Ed. 1955. 420 pgs. (Source 6) $4.76
Fitting and Showing Dairy Cattle. 112 pgs. 1952. (Source 3) $2.00
Dairy Production. Diggins and Bundy. 342 p. 1955. (Source 8) $5.65

PRODUCTION

Swine Production. Bundy and Diggins. 337 p. 1956. (Source 8) $6.00

CROPS AND SOILS

Soil Fertility. Millar. 1955. 436 pages. (Source 6) $6.75
Crop Production: Principles and Practices. Ahlgren and Delorit. 629 pages. 1953. (Source 8) $6.35
Soil: Use and Improvement. Stallings. 403 pages. 1957. (Source 8) $5.95

GRASSES AND LEGUMES

Forages: The Science of Grassland Agriculture. Hughes. 724 pages. (Source 3) $5.95
Range and Pasture Book. Donahue, Evans and Jones. 406 p. 1956. (Source 8) $6.00

FARM MANAGEMENT & ACCOUNTING

Managing the Farm Business. Beneke. 1955. 464 pages. (Source 6) $3.96
Farm Records and Accounting. Hopkins and Heady. (Source 3) $4.50
How to Make Your Farm Pay. Malone. 1951. 371 pages. (Source 3) $3.95

LIVESTOCK HEALTH ENCYCLOPEDIA

Edited by R. Seiden. How to improve the health of your cattle, sheep, hogs, other livestock. Which remedies to use for best results, at lower cost, in prevention and treatment of diseases, parasites, common injuries. The advice of 314 specialists in easy ABC order. 624 pages, 300 illustrations. **$7.50**

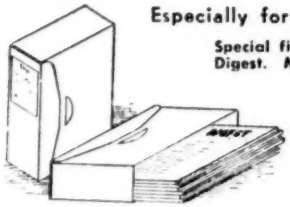
Springer Publishing Company, Inc.
44 E. 23rd St. New York 10, N.Y.

Don't lose important records, use this new method —

NEW FARMER'S DIGEST FARM AND HOME FILES

. . . 8 files of your choice, only $2.95 postpaid

Now, keep your farm business records filed neat and handy, right at your finger tips. Avoid losing expense records that save tax money. Keep machinery instruction books, crop and livestock records, etc. Made of white-lined cardboard covered with leather-like, forest green paper. Shipped folded flat. Look fine on your office or home bookshelves. Available with printed labels at right. Size 2" thick by 10" high by 7" deep. Specify files desired by number. Send check to address below.



Especially for Farmer's Digest —

Special file holds one year of Farmer's Digest. Makes a 1000-page, completely indexed library of a one year subscription. Has advantages over binding that costs $4.00 per year. Order with other files listed at right or send 50¢ for one file, $1 for three.

Farmer's Digest, Fort Atkinson, Wisconsin

HAVE A BEAUTIFUL FARM SIGN

A fine sign builds prestige for you and your farm, helps you sell breeding stock, dresses up your place. Sign illustrations are in full color, accurately painted to represent true-type animals. All signs 24" by 30". Furnished with bracket illustrated. All you need is a sign post. To order, take your choice of one of these attractive illustrations painted in beautiful colors:

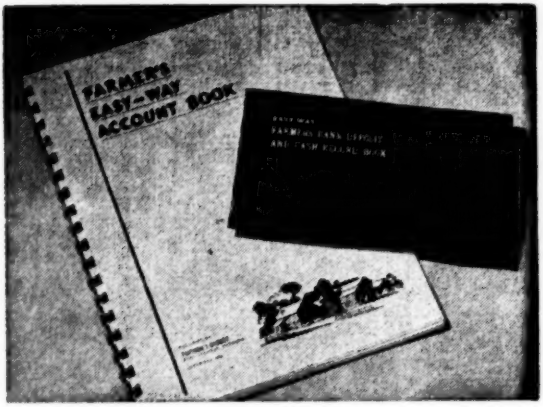
Guernsey	Angus	Rhode Island Red
Jersey	Shorthorn	Hereford Hog
Holstein	Polled Shorthorn	Hampshire Sheep
Ayrshire	Milking Shorthorn	General Stock farm, showing ear of corn, hog and beef cow.
Brown Swiss	Leghorn Rooster	
Hereford	Turkey Gobbler	
	White Holland Turkey	

Price below includes painting up to 20 letters of your name or farm name on each side. For extra letters for longer names, add 20¢ each. Shipped express charges collect. For sign complete, send only $18.95 with your order. No C.O.Ds. To reflectorize the lettering on both sides of your sign, add $4.00 to price above.

Your Choice of Beautiful, True-Type Color Illustration

FARM SIGNS, Box 404, Fort Atkinson, Wis.

Let Your Bank Keep Your Books

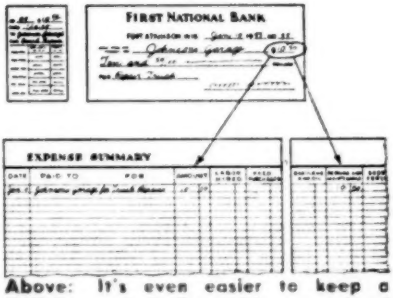


New farm bookkeeping system makes your bank book a record of farm income and cash expenses . . . your check book a record of other farm expenses. You save time and taxes . . .

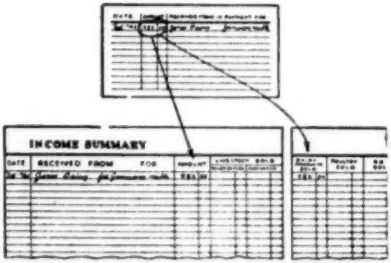
Here's a new idea that lets you do your farm record keeping when you "darn well" feel like it. It gets you away from being a bookkeeper everyday of the year . . . yet accurately records information you must have to make money farming and avoid paying taxes you don't owe.

Secret of the new system—"It lets your bank keep your books." It provides a special farm bank deposit or pass book that you can substitute for the bank book you now use. In this new bank book, you or the teller have ample space to record where your deposits come from and what you sell. At the end of the year, a complete record of your farm income is ready to transfer to your Easy-Way Account Book.

For cash purchases which are easily forgotten and difficult to prove, special forms are provided in the Easy-Way Deposit Book.



Above: It's even easier to keep a definite and indisputable record of your farm expenses as you go through the year. Just do what you should do anyway . . . pay by check. Note on the check or the stub what you bought or paid for. Later transfer this information to the Expense Summary of your Easy Way Account Book. Again, you automatically get the figures required for your income tax return.



Above: It's fast and easy to transfer income figures from the Easy Way Bank Book to the Account Book.

Have a complete accounting of your farm business or only that required for your tax return. One farm family, using a similar system, figured time spent paid them $25.00 an hour. Start the new year right. Order your Easy-Way System today. Your money back if you aren't completely satisfied. New low price only $1.95.

(Note: New Account Books supplied without plastic binding illustrated above permit reducing the price of our Easy-Way Set to $1.95 from old $2.95 price.)

Send your order to—

FARMER'S DIGEST
Fort Atkinson, Wisconsin